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# THIRD ANNUAL REPORT

OF THE

## BOARD OF PUBLIC WORKS,

TO THE

COMMON COUNCIL

OF

THE CITY OF CHICAGO.

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APRIL 1<sup>ST</sup>, 1864.

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CHICAGO:  
JAMESON & MORSE, BOOK AND JOB PRINTERS,  
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1864.

## BOARD OF PUBLIC WORKS.

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### COMMISSIONERS.

JOHN G. GINDELE, PRESIDENT.

FREDERICK LETZ, TREASURER.

ORRIN J. ROSE.

FRANCIS C. SHERMAN, MAYOR,

AND EX-OFFICIO MEMBER OF THE BOARD.

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### OFFICERS.

A. W. TINKHAM, SECRETARY.

E. S. CHESBROUGH, CITY ENGINEER.



# COMMISSIONERS' REPORT.

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OFFICE OF THE BOARD OF PUBLIC WORKS, }  
CHICAGO, APRIL 1, 1864.

*To the Mayor and Aldermen of the City of Chicago, in Common Council assembled:*

The Board of Public Works respectfully submit herewith their annual report for the fiscal year ending March 31st, 1864.

## WATER WORKS.

### INCOME.

The total revenue derived during the year amounts, from									
water taxes, to	-	-	-	-	-	-	-	-	\$190,841.99
And from profits tapping pipes, to	-	-	-	-	-	-	-	-	1,404.40
Total, -									\$192,246.39

Increase in the amount of water taxes over the receipts of									
the same for the year previous,	-	-	-	-	-	-	-	-	\$23,090.77

The Board have continued to add to their number of water meters in use, and with increasingly satisfactory results. It is now a rule with the Board to determine by meters the charge for water for all large consumers. The water tax ascertained by meters, during the last fiscal year, amounts to \$23,516.00.

## EXPENSES AND REPAIRS.

The expenses of the last fiscal year were as follows, viz. :

Interest on Water Loan Bonds, - - - - -	\$72,033.10
Expenses at the pumping works, - - - - -	24,619.96
Miscellaneous repairs, including work on new inlet, and water meter repairs and expenses, - - - - -	10,157.30
Miscellaneous operating expenses, including salaries and office expenses, - - - - -	22,396.50
Total, interest, expenses and repairs, - - -	<u>\$129,206.86</u>

## COST OF ADDITIONS TO THE WORKS DURING THE YEAR.

Besides the foregoing, there was expended during the year—

For laying about 13 miles of water pipes, - - -	\$75,241.29
For otherwise extending the works, not including lake tunnel, - - - - -	1,913.35
For lake tunnel—surveys, borings, drawings, etc., - -	2,919.62
Total cost of extending works during year, - - -	<u>\$80,074.26</u>

## PRESENT COST OF WATER WORKS AND HOW PAID FOR.

Cost of the Water Works, April 1st, 1864, including Lake Tunnel, - - - - -	\$1,198,569.23
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The means by which the works have been built have been derived as follows, viz. :

Six per cent. bonds outstanding, \$1,030,000.00, less \$79,384.09 for discount, (the bonds having generally been sold at their seven per cent. par value,) - -	\$950,615.91
Seven per cent. bonds outstanding, - - - - -	103,000.00
Balance derived from water rents, - - - - -	144,953.32
	<u>\$1,198,569.23</u>

The Board have not found it necessary to issue any bonds since 1861. The income of the works is sufficient to provide for any ordinary enlargement, such as extending the distributing mains, besides paying the interest and expenses.

## WATER PIPES LAID.

There have been laid during the year 13 miles and 51 feet of 4, 6, and 8 inch distributing mains, and in the three divisions of the city, as follows, viz. :

South Division,	-	-	-	-	14,286 feet.
West Division,	-	-	-	-	43,082 "
North Division,	-	-	-	-	11,323 "

Total length of water pipes laid during the year, 68,691 ft., or 13 miles and 51 feet.

There are now laid in the city 6 miles and 2,247 feet of supply mains, and 111 miles and 2,694 feet of distributing mains. Total amount laid of water pipes of all sizes, 117 miles and 4,941 feet.

Notwithstanding the amount of water pipes laid during the year was large, as stated above, it still fell considerably short of the amount which the Board were urged to lay, by applicants from all parts of the city. The Board have now before them petitions for supplying streets with water, many of them, too, in pressing need of it, to supply which will require as much as ten miles of pipes; and we are constantly receiving additional petitions. There remain to be delivered, of last year's contract, 140 tons of pipe, and we have ordered a further supply of 400 tons, to be delivered soon after the opening of navigation, which, altogether, will provide for some seven miles of the streets to be supplied. The present cost of the iron, and of the labor and materials generally to be applied in laying the pipes, is, however, so excessive, that an amount of water tax which would warrant, in ordinary times, the putting down of the pipes in a street, will not now pay half the interest on the cost of the pipes and the current expenses. To avoid entailing a heavy, unproductive debt on the Water Works, the Board are compelled to limit the laying of the pipes to such places as are in most urgent need of the water, and where, also, the buildings needing water are most numerous and will yield the greatest amount of water tax. The more than usual demand for the water pipes is one of the consequences of the marked growth of the city during the year.

The Board will, early in the season, invite bids for 500 tons more of pipes, but even with this addition it will be impossible to extend the pipes to many localities for which a supply of water is asked.

## LAKE TUNNEL.

The most important event connected with the Water Works, and making a part of their history for the year, is the commencement of work on the tunnel, to be extended out under the bed of Lake Michigan two miles, so that the water will be drawn from the lake that distance from the shore. This project was fully set forth in our last report, and was finally adopted by the Board early last year, as that promising to secure most certainly, and with least expense to the city, its supply of water from a point in the lake where it will not be affected by the discharge from the river, or other impurities from the lake shore.

During the summer, examinations were made along the whole line of the contemplated work, by boring, at short intervals, to the depth proposed for the tunnel, to ascertain the character of the material through which it would pass, and various observations were made to test the quality of the water at the proposed outer end and inlet for the tunnel, and to ascertain also the distance from the shore to which the water of the river reached after certain most marked discharges of the river into the lake. From the borings, it was found that the material through which the tunnel would be built was uniformly clay, and apparently of a firm and even character; and the observations concerning the effect of the river on the lake, showed that, even when most marked, no trace of its influence could be detected much more than a mile and a quarter from the shore. The information obtained on these and various other points, satisfied the Board that the tunnel would accomplish the results sought for, and that the work was entirely practicable. The necessary drawings and specifications were prepared as speedily as practicable, and advertisements were issued in New York and Boston, as well as here, inviting proposals for the doing of the work. The bids were received and opened Sept. 9th, 1863, most of the parties submitting proposals being present at the opening. The following record describes particularly the bids received:

## Bids Received for the Lake Tunnel, September 9, 1863.

NAMES OF BIDDERS.															
		Lake Tunnel complete	Lake Tunnel and land shaft alone in case there should be two (2) lake shafts.	Lake Tunnel and land shaft alone in case there should be three (3) lake shafts.	Lake Tunnel and land shaft alone in case there should be four (4) lake shafts.	Outer Crib.	One Intermediate Crib.	2d Intermediate Crib.	3d Intermediate Crib.	Each additional foot in height.	Outer Cast Iron Cylinder.	First Intermediate Iron Cylinder.	Second Intermediate Iron Cylinder.	Third Intermediate Iron Cylinder.	Each lb. of increased length or size.
James Andrews,.....	(Pittsburgh, Pa.)	\$230,548	\$151,987	\$148,000	\$144,000		\$26,021	\$23,419	\$20,000	\$300.00	\$14.32.*	\$11,112	\$11,112	\$11,112	4 1-5 cts
James J. Dull & James Gowen,.....	(Harrisburg, Pa.)	\$315,139													
Stephen C. Walker, Asa D. Wood, & F. W. Robinson,.....	(New York)	\$315,000†								\$200.00					10 cts.
Thos. Williams, John McBean, A. S. Brown, & George Neilson,.....	(Chicago)	\$490,000‡								\$1,250.00	16c p lb.	16c p lb.	16c p lb.	16c p lb.	16c p lb.
Hervey Nash,.....	(Chicago)	\$40 per lined ft.													
D. L. DeGolyer,.....	(Chicago)	\$620,000§	\$410,000	\$400,000	\$380,000 "360,000?"										
William Baldwin,.....	(New York)	\$100 per lined ft.													
		\$1,056,000													

\* Included in first general proposal, and would not be contracted for separate. Would deduct from my first general proposition, in case the Board furnish and sink this cylinder, \$14,320.

† Meaning to include but one intermediate lake shaft. This proposal is based upon the supposition that the material to be excavated is firm, and such that the tunnel can be made and the masonry built without the use of permanent bracing. But if in the prosecution of the work, to secure its safety, permanent bracing should be required, the attendant increased expenses shall be paid by the City. The Chief Engineer to decide the amount.

‡ For all the work except the iron cylinders for shafts. In case sand or gravel veins occur, to be paid for extra. This sum includes four cribs.

§ I run the risk of all loose earth, sand, or gravel.  
 || \$100 per lined foot, if material is "stiff blue clay soil." If otherwise extra pay and extra time will be required.



The terms in which the first bid of the foregoing list was expressed, were such that, apparently, the bidder did not propose to construct the whole work for a definite sum, and as so understood, it was rejected as indefinite and uncertain. The bid of Messrs. Dull & Gowen, of Harrisburg, Pa., being unconditional, and for the whole work, it was accepted by the Board the day after the reception of the proposals, as the lowest and best bid. Soon after its acceptance, the Board made report of their doings to the Common Council, and requested to be authorized to proceed with the work, and to issue bonds to provide for its cost. The Council granted this desired authority by ordinance of October 5th, 1863. A copy of the contract, as executed at a considerably later day, will be found appended to this report.

Subsequently to the execution of the contract, the Board decided to change the manner of constructing the land shaft, which was originally designed to be wholly of brick, and is so described in the specifications. The change consisted in substituting three cast iron cylinders, each ten feet long, essentially like the iron cylinders proposed for the outer lake shaft, in place of the brickwork of the upper thirty feet of the shaft. This was done to facilitate the sinking of the shaft through the bed of quicksands overlying the clay, the distance through the quicksands to the clay being about twenty-four feet.

The formal breaking of ground took place March 17th last, and the work has been in progress since that time, with occasional interruptions. As was anticipated, a good deal of difficulty has been experienced by the contractors in working through the water and quicksands, but the difficulty has been much less with the iron cylinders than it would have been with brick work, and the clay having been reached, we may reasonably hope that we shall not have serious trouble from this cause hereafter. Of course the work is not sufficiently advanced to enable the Board to form a conclusion as to what rate of progress may be looked for. The time fixed in the contract for the completion of the work, is November 1st, 1865.

Besides the change in the manner of constructing the land shaft, the Board have agreed with Messrs. Dull & Gowen to make certain changes in the outer crib, so that the crib will be stronger than as originally proposed, and so that solid masonry can be eventually substituted for the mass of loose stones with which the crib will be filled. All these changes are described particularly in the copies of the several agreements with Messrs. Dull & Gowen, presented in connection with the appended copy of their contract.

The State legislature had previously given the necessary authority for placing in Lake Michigan any piers to be found necessary for constructing and maintaining the tunnel, but to avoid any question as to the right of the State to make such a grant, the sanction of the United States to the act of the State legislature was obtained, by act of Congress, passed January 16th, 1864, a copy of which will be found appended to this report.

#### PUMPING WORKS.

It is evident that it will soon be necessary to increase the pumping power of the works. With the view of making timely preparation for this want, the Engineer of the pumping works, Mr. D. C. Cregier, under instructions from the Board, visited last winter all the principal water works of the country where artificial power is used for the elevation of the water, and inspected their machinery. His report, submitted to the City Engineer and embraced in his, contains the views of Mr. Cregier as to the need of another engine, and will be found by you interesting and worthy of consideration.

For a full representation of the state of the water works and of the various operations on the same in progress during the year, as also for similar statements in regard to the sewerage works of the City, we respectfully refer you to the accompanying report to the Board of Mr. E. S. Chesbrough, the City Engineer.

## SEWERAGE WORKS.

The report of the City Engineer, already referred to, exhibits so fully the progress and state of the sewers, that we need hardly more than call your attention to it. The amount of work done last year in extending the sewers, was considerably greater than usual. There were built in the three Divisions of the City, during the year, as follows, to wit:

South Division,	7573 ft. of Sewers of all sizes,	costing	- \$57,143.08
West     "	20407     "     "     "     "     "		- 80,719.50
North    "	11625     "     "     "     "     "		- 32,350.14

Altogether there were built  $7\frac{2}{3}\frac{6}{2}\frac{4}{3}\frac{5}{0}$  miles of sewers, costing \$170,212.72

There are now laid in the City  $61\frac{3}{5}\frac{7}{2}\frac{7}{3}\frac{3}{0}$  miles of Sewers, distributed thus in the three Divisions:

In the South Division,	-   -   -	26 miles,	1,173 ft.
"   West     "	-   -   -	20   "	4,492 ft.
"   North    "	-   -   -	17   "	3,388 ft.

The expenditures for the construction of the Sewers	
amount to date to,	-   -   -   -   -   -   \$895,369.57

There are outstanding of sewerage bonds:

Six per cent. bonds,	-   -   -   -   -   -	\$87,000
Seven   "         "	-   -   -   -   -   -	975,000
Total,	-   -   -   -   -   -	<u>\$1,062,000</u>

By the present sewerage law, the proceeds of bonds can be applied only to extending the works. The interest on sewerage bonds, the expenses of cleaning, repairing and maintaining the sewers, all incidental



expenses, and the annual provision for the sewerage sinking fund, are paid by the proceeds of the annual tax, termed "sewerage tax." These expenses were last year as follows :

Interest on sewerage bonds,	-	-	.	-	\$67,965.38
Repairs of sewers,	-	-	-	-	2,058.11
Cleaning of sewers,	-	-	-	-	5,065.40
Office expenses and salaries,	-	-	-	-	8,928.98
Sewerage sinking fund,	-	-	-	-	17,398.75
					<hr/>
					\$101,416.62

The entire sewerage tax of last year as assessed, amounted to \$106,-668.31, all of which will be collected and placed to the credit of the sewerage fund, excepting, perhaps, some \$1,500.

The sewers throughout the city are in as good repair as usual, and the sewerage system continues to effect, thoroughly the drainage of the districts to which it is extended. As will be seen by the foregoing statement, the annual expenses for cleaning and repairing are comparatively small, and but little exceed those of last year, with a smaller extent of sewers.

The demand for the extension of the sewers, as of the water pipes, has been and is very great. The Board find it quite impossible to gratify the wishes of the property owners and residents of many of the localities where the sewers are petitioned for and needed. We have commenced laying some sewers in various parts of the city, which were included in the contracts of last year, and propose to finish up these contracts as rapidly as possible. It is, however, only with great difficulty that we can just now obtain brick for these sewers. It is the judgment of the Board that in addition to the sewers referred to as contracted for last year, it is not advisable for the city to build many new sewers this year, on account of their present great cost. For any sewers built, bonds must be issued, and for a permanent sewerage debt made for work done now, the city gets an extent of sewers much less than what the same debt would lay in ordinary times. We hence desire to restrict the sewerage extension of this year as much as shall be practicable, and to lay only such sewers as will cause the greatest general benefit.

## SEWERAGE SINKING FUND.

The condition of the sewerage sinking fund may be briefly stated as follows, viz:

Cash in the hands of the City Treasurer to be invested as required by the city charter in bonds of the City of Chicago,       -       -       -       -       -       -       -	\$15,957.55
Due from the sewerage tax of 1863,       -       -       -	17,398.75
Value of three mortgages on real estate in the City of Chicago,       -       -       -       -       -       -       -	19,021.61
Amount of the sinking fund as above which has not been applied to the extinguishment of sewerage bonds,....	\$52,377.91

There have been purchased and canceled of the sewerage bonds, altogether, \$58,000, of which amount \$20,000 were canceled during the past year.

By the charter, the Board are required to direct as to the investment of the sewerage sinking fund, but are by its provisions confined to the bonds of the City of Chicago for investment.

## CHICAGO RIVER.

The condition of the river during the year has been about as it has been for the last two or three years. At times it has been in a very offensive state, nor can it be otherwise so long as it is made the receptacle of the filth of the distilleries, cattle and hog yards, slaughtering establishments and like establishments on its banks, throwing out an immense amount of animal and vegetable offal.

The Board, last year, in their annual report, recommended to your honorable body that as a preliminary work, a covered aqueduct be made through North Street, of twelve feet diameter, connecting the lake and river, and that machinery be erected for forcing sufficient water through this aqueduct to change the water between North Street and the mouth of the river once in twenty-four hours. This pumping could be resorted to as often and continued as long as necessary, and we have every confidence would prevent all offensiveness in the river between its mouth and North Street. We respectfully refer you to that report, pp. 12, 13, and pp. 54-61, and can do no more than to renew the recommendation there made. The estimated cost, as there presented, will now be too small, and it will probably be as much as \$200,000.

The Board are of the opinion that this work should be entered upon this season, notwithstanding the present high prices of labor and material. It is so essential to the welfare of the city, that it seems to us not well to defer it.

## CHICAGO HARBOR.

The question as to what means shall be taken for improving and preserving our harbor, is one of the utmost importance to the city, demanding the most deliberate and thorough consideration. To secure a safe and direct channel through the bar at the mouth of the harbor, will necessarily require a large expenditure, and to maintain it, it is probable that there must be every year a considerable outlay. But, having determined upon a plan which shall seem best fitted to make the harbor easy and safe of access, and to preserve it in that condition, the improvement should be entered on at once. The prosperity and the very existence of the city depend upon the maintenance of its commercial facilities. It would seem that these improvements ought to be paid for wholly or in part by the general government; but if not so done, they should be undertaken without loss of time, by the city.

Last July it became evident that the existing circuitous channel was becoming obstructed from deposits of sand, and it was feared that the obstruction might become sufficiently serious to hinder the passage of the larger vessels entering or leaving the harbor. With the view of getting a channel, speedily, of sufficient depth, even though it might be but temporary, the attempt was made to dredge out a channel with fourteen feet depth of water across the bar, and between the lines of the north and south piers. As the dredges did not get to work till late in July, and the fall winds commenced soon after, the attempt was not successful, so far as obtaining a channel which could be used last year. The cut was partially made, but has been much filled up by the winter and spring storms. It will be necessary, without doubt, to take measures this present season for opening and maintaining the channel, and we are now making investigations for the purpose of securing some plan for the permanent improvement of the entrance to the harbor, which will be submitted to you, when sufficiently matured.

## STREETS.

The amount appropriated by the city last year for the streets, was hardly adequate to keep them in a tolerable condition by slight repairs and cleaning. A number of important improvements paid for or to be paid for (excepting the intersections of cross streets and alleys) by assessments on the private property abutting on the street, have been undertaken by the Board during this year, and are completed or in the stage of progress stated hereafter.

## NICHOLSON PAVEMENT.

West Lake St. between Halsted St. and the bridge approach.

This important improvement is in progress, and is expected to be completed early this season.

Intersection of Clark and Randolph Sts. Finished.

Intersection of Clark and Madison Sts. Finished.

## MACADAMIZING.

Market St., from Madison St. to Van Buren St. Finished.

Canal St., from Lake St. to Fulton St. Finished.

Milwaukee Avenue, from Elston Road to center of North Avenue. In progress, and expected to be finished early this season.

Canal St., from Twelfth St. to S. Br. G. & C. U. R. R. In progress, to be finished soon.

## GRAVELING.

North Clark St., from Wells St. to Fullerton Avenue. Finished.

## PLANKING.

Alley block 46, original town. Finished.

Alley block 7, Fort Dearborn addition. Finished.

A most important decision relative to the assessments for the improvements of the streets, has lately been rendered by the Superior Court of this city, which, if sustained by the Supreme Court, will effectually stop

all street improvements by assessment until a change shall be made in the city charter. The decision is that the manner of making an assessment for the cost of a street improvement, as prescribed in the city charter, is unconstitutional, or, more particularly, that the provision in the city charter, Section 21, Chapter VII, to wit: "Said assessment shall be made in such manner, or as nearly as may be, that each separate block, lot, sub-lot, piece or parcel of land, on either side of the street or part of street to be improved, shall sustain the cost and expense of making and completing the improvement upon that half of the street, directly adjacent to or in front of the same," is in conflict with the provisions of Sec. 5 of the 9th Article of the Constitution of the State of Illinois, thus expressed :

"The corporate authorities of counties, townships, school districts, cities, towns and villages, may be vested with power to assess and collect taxes for corporate purposes; such taxes to be uniform in respect to persons and property within the jurisdiction of the body imposing the same."

The Superior Court has decided in substance that an assessment made in the manner prescribed in the foregoing section of the city charter, is not a special assessment, because it is not made with reference or in proportion to the benefits resulting from the proposed improvement to the property assessed; but that an assessment so made is a tax, within the meaning of Sec. 5, Art. 9, of the State Constitution, and is for a corporate purpose, and being a tax, and for a corporate purpose, and not being uniform in respect to persons and property within the limits of the city, is in violation of the said section of the constitution.

#### OPENING AND EXTENDING STREETS.

The following street extensions have been consummated during the year :

Dearborn St. Widened from Madison St. to the alley of the Post Office.

Walnut St. Extended through E.  $\frac{1}{2}$  block 45, Canal Trustees Sub. of Sec. 7, 39, 14.

Holt St. Extended from Clarinda to Cornell St.



## SIDE WALKS

ORDERED BY THE COUNCIL DURING THE YEAR.

## SOUTH DIVISION.

E. side	Indiana av. bet. 22d st. and Ridgely place.	Partly laid.
E. side	State st. bet 22d st. and Monterey st.	Laid.
E. side	Michigan av. bet. South Water st. and Chicago river.	Laid.
S. side	Hardin pl. bet. Cottage Grove av. and Douglas av.	Laid.
W. side	Dearborn st. bet. Archer road and South st. (22d)	Laid excepting 30 ft.
N. side	Archer road bet. Halsted st. and Lock st.	Laid.
E. side	Michigan av. bet. 12th st. and 23d st.	Laid 12th to 16th st. and nearly so 16th to 23d st.
W. side	Michigan av. bet. 12th st. and 18th st.	Laid.
W. side	Cottage Grove av. bet. Ridgely pl. and Douglas pl.	In progress.
N. side	Douglas pl. bet. Cottage Grove av. and the Lake.	Not laid.
W. side	Ellis av. bet. Douglas pl. and City Limits.	Laid.
B. sides	Indiana av. bet. 14th st. and 22d st.	In progress.
E. side	McGlashen st. bet. 22d st. and Archer road.	Laid.
E. side	Halsted st. bet. 26th st. and Halsted st. bridge.	Laid.
N. side	Douglas pl. bet. Cottage Grove av. and Kankakee av.	Not laid.
W. side	Sanger st. bet. Archer road and Kossuth st.	Laid.
S. side	22d st. bet. Cottage Grove av. and Wabash av.	Laid.
E. side	Wabash av. bet. 22d st. and 24th st.	In progress.
N. side	Douglas pl. bet. Kankakee av. and Forest av.	Not laid.
W. side	Prairie av. bet. Cottage Grove av. and 29th st.	In progress.
S. side	20th st. bet. State st. and Butterfield st.	Laid.
S. side	22d st. bet. Archer road and Grove st.	In prog's—nearly all l'd.
W. side	Wentworth av. bet. 17th st. and 18th st.	In progress.
S. side	17th st. bet. Wentworth av. and Clark st.	Not laid.
N. side	Archer road bet. Lock st. and Reuben st.	Nearly all laid.
E. side	Deering st. bet. Archer road and Cologne st.	Laid in part.
W. side	Main st. bet. Archer road and Cologne st.	In progress.
S. side	Hickory st. bet. Mary st. and Lock st.	Not laid.
W. side	Deering st. bet. Archer road and Lyman st.	In progress.
N. side	Fuller st. bet. Archer road and Cologne st.	In progress.
W. side	Bonfield st. bet. Archer road and Hickory st.	In progress.
S. side	19th st. bet. Clark st. and State st.	In progress.
E. side	Joscp'h st. bet. Archer road and Hickory st.	In progress.
S. side	Cologne st. bet. Main st. and Fuller st.	In progress.
N. side	Hickory st. bet. Mary st. and Deering st.	In progress.
W. side	Buddan st. bet. Archer road and Alexander st.	Laid in part.
E. side	Wentworth av. bet. 21st and 22d st.	Laid in part.

## SIDEWALKS. — CONTINUED.

## WEST DIVISION.

S. side	Warren st. bet. Wood st. and Lincoln st.	Laid.
S. side	Warren st. bet. Reuben st. and Paulina st.	Laid.
B. sides	Clinton st. bet. Van Buren st. and Harrison st.	Laid.
S. side	Washington st. bet. Robey st. and Hoyne st.	Laid, excepting 150 ft.
B. sides	Park av. bet. Wood st. and Lincoln st.	Laid. [exc. 100 ft.
B. sides	Park av. bet. Robey st. and Hoyne st.	N. side ld. S. side laid
N. side	Washington st. bet. Wood st. and Lincoln st.	Laid.
W. side	Reuben st. bet. Lake st. and Park av.	Laid.
W. side	Oakley st. bet. Lake st. and Madison st.	Laid.
E. side	Paulina st. bet. Madison st. and Lake st.	Laid.
W. side	Elizabeth st. bet. Lake st. and Randolph st.	Laid.
E. side	Charles st. bet. Van Buren st. and Depuyster st.	Laid.
B. sides	Barber st. bet. Canal st. and Stewart av.	Laid.
B. sides	String st. south from Canalport av.	Laid, exc. 4 lots.
W. side	Hoyne st. bet. Madison st. and Van Buren st.	Not laid.
B. sides	Barber st. bet. Canal st. and Jefferson st.	Laid.
E. side	Jefferson st. bet. Judd st. and Meagher st.	Laid, exc. 4 lots.
S. side	Taylor st. bet. Halsted st. and Desplaines st.	Laid.
B. sides	Newberry st. bet. 12th st. and Taylor st.	Laid.
S. side	Taylor st. bet. Newberry st. and Halsted st.	Laid.
N. side	Monroe st. bet. Rucker st. and Throop st.	Laid.
B. sides	Barber st. bet. Union st. and Halsted st.	Not laid.
W. side	Ann st. bet. Lake st. and Kinzie st.	Laid, exc. 2 lots.
E. side	Loomis st. bet. Van Buren st. and 12th st.	Partly laid.
N. side	Monroe st. bet. Morgan st. and Rucker st.	Partly laid.
E. side	West Water st. bet. Madison st. and Randolph st.	Not laid.
W. side	Ridgeville road bet. Milwaukee av. and North av.	Not laid.
E. side	Jefferson st. bet. Mitchell st. and 22d st.	Not laid.
W. side	Lafin st. bet. Van Buren st. and Taylor st.	Not laid.
B. sides	Coolidge st. bet. Throop st. and Reuben st.	Laid.
W. side	Hoyne st. bet. Washington st. and Park av.	Laid.
N. side	Carroll st. bet. North Ann st. and Elizabeth st.	Laid.
W. side	Noble st. bet. Milwaukee av. and Division st.	Not laid.
N. side	12th st. bet. May st. and Blue Island Av.	Laid.
B. sides	Hubbard st. bet. May st. and Rucker st.	Laid.
W. side	Ada st. bet. Lake st. and Randolph st.	Not laid.
N. side	Rebecca st. bet. Blue Island av. and Rucker st.	Partly laid.
N. side	North av. bet. Elston road and bridge.	Partly laid.
E. side	Elston road bet. North av. and Wabansia av.	Laid.
W. side	Elston road bet. Wabansia av. and Armitage road.	Laid.
W. side	Leavitt st. bet. Kinzie st. and Lake st.	Not laid.
N. side	Washington st. bet. Oakley st. and Western av.	Not laid.
B. sides	Ewing st. bet. Canal st. and Beach st.	Laid, exc. 50 feet.
B. sides	Evans st. bet. Halsted st. and Union st.	Laid, exc. 100 feet.
S. side	22d st. bet. Halsted st. and Reuben st.	Not laid.
N. side	Van Buren st. bet. Sangamon st. and Aberdeen st.	Not laid.
E. side	Aberdeen st. bet. Jackson st. and Harrison st.	Laid.
W. side	Carpenter st. bet. Fulton st. and Kinzie st.	Not laid.
S. side	Catharine st. bet. Blue Island av. and Morgan st.	Partly laid.
N. side	Van Buren st. bet. Throop st. and Loomis st.	Partly laid.
S. side	Carroll st. bet. Wood st. and Robey st.	Laid.
N. side	Jackson st. bet. Rucker st. and Loomis st.	Laid, exc. 4 lots.
E. side	Throop st. bet. Jackson st. and Monroe st.	Not laid.



## SIDEWALKS. — CONTINUED.

## WEST DIVISION. Continued.

E. side	Peoria st. bet. Randolph st. and Washington st.	Not laid.
B. sides	Kramer st. bet. Union st. and Halsted st.	Laid, exc. 4 lots.
W. side	Holt st. bet. Chicago av. and Cornell st.	Not laid.
B. sides	Catharine st. bet. Canal st. and Jefferson st.	Partly laid.
N. side	Walnut st. bet. Paulina st. and Wood st.	Laid.
N. side	Jackson st. bet. Robey st. and Hoyne st.	Not laid.
N. E. s	Milwaukee av. bet. Reuben st. and Wood st.	Not laid.
W. side	Halsted st. bet. Milwaukee av. and Fourth st.	Partly laid.
S. side	Pratt st. bet. Milwaukee av. and Sangamon st.	Not laid.
N. side	Liberty st. bet. Canal st. and Jefferson st.	Laid, exc. 100 feet.
B. sides	Barber st. bet. Jefferson st. and Union st.	Partly laid.
B. sides	Canal st. bet. Van Buren st. and 16th st.	Not laid.
W. side	Morgan st. bet. Taylor st. and 12th st.	Laid.
N. side	Walnut st. bet. Hoyne st. and Robey st.	Laid.
E. side	Hoyne st. bet. Walnut st. and Lake st.	Not laid.
W. side	Aberdeen st. bet. Taylor st. and 11th st.	Not laid.
W. side	Halsted st. bet 22d st. and the bridge.	Partly laid.
W. side	Robey st. bet. Lake st. and Park av.	Laid.
B. sides	Park av. bet. Lincoln st. and Robey st.	200 feet laid.
S. side	Fulton st. bet. Green st. and Elizabeth st.	Laid, exc. 50 feet.
S. side	16th st. bet. Halsted st. and Rucker st.	Not laid.
N. side	Liberty st. bet. Canal st. and Stewart av.	Laid.
E. side	Elston road bet. Mil. R.R. crossing and North av.	Not laid.
S. side	Post st. bet. Reuben st. and Canal bridge.	Not laid.

## NORTH DIVISION.

E. side	Dearborn st. bet. Maple st. and Elm st.	Laid.
S. side	Chicago av. bet. Wells st. and Clark st.	Laid.
B. sides	Whitney st. bet. Green Bay road and Dearborn st.	In progress, partly laid.
S. side	Goethe st. bet. Clark st. and Wells st.	Not laid.
S. side	Erie st. bet. Clark st. and La Salle st.	Laid.
E. side	North Wells st. bet. North av. and Clark st.	Laid.
N. side	Carl st. bet. Wells st. and La Salle st.	Laid.
W. side	Franklin st. bet. Sigel st. and North av.	Laid.
S. side	Divis'n st. fm Market st. to a point op. Clybourne av.	Laid.
B. sides	Vine st. bet. Division st. and Vedder st.	Partly laid.
S. side	Oak st. bet. Clark st. and Wolcott st.	Not laid.
S. side	Superior st. bet. Dearborn st. and Wolcott st.	Laid.
S. side	Whitney st. bet. Wells st. and Franklin st.	Laid.
E. side	Otis st. bet. Division st. and Vedder st.	Partly laid.
B. sides	Grace st. bet. Division st. and Vedder st.	Partly laid.
S. side	Granger st. bet. Wells st. and Sedgwick st.	Partly laid.
W. side	Sedgwick st. bet. Little Fort road and Clark st.	Laid.
W. side	Clark st. bet. Cane st. and Belden st.	Laid.
B. sides	La Salle st. bet. Division st. and North av.	Not Laid.

The foregoing lists represent but a part of the work done on sidewalks. Probably more new walks are built under the orders of the *Board* to "relay," than under the orders of the *Council* directing the construction of walks where there have been none previously.

## BRIDGES.

The past year has been one of unusual expenditures under this head, both for repairs of the bridges and rebuilding them.

The most important repair of the year has been on the center protection of Clark Street bridge. This is now being entirely rebuilt, at a cost of about \$4,000. As already remarked, the expenditures for repairs on the bridges generally have been unusually large.

On the 3d of last November, the iron bridge crossing the river at Rush Street was accidentally destroyed. This accident was the most serious one of its kind that has ever befallen the city. At the time of its occurrence, a drove of cattle was being driven over the bridge, and a considerable number were on the bridge at the time it was turned. The movements of the cattle on the bridge while it was being turned appear to have caused it to tip, so that two of the six wheels of the turntable sustaining it were crushed. Finally the three trusses were thrown down laterally, and the bridge fell, a mass of ruins, bending and breaking over the center pier, and dropping into the river on either side of the pier. Several persons were on the bridge at the time of the accident, some of whom were thrown into the river, but fortunately no lives were lost. Many of the cattle were caught by the falling trusses, their bodies being jammed in between the iron rods, posts and braces, and others were thrown into the river.

Immediate measures were taken to rebuild the bridge. It was ascertained that to rebuild the iron bridge would take some six months of time, and it was judged best to replace it with a wooden one. As soon as possible, after being properly authorized by you, bids were received for a new bridge, and, November 14th, the work was let to Fox & Howard. During the progress of the work the weather became very severe, but the bridge was opened for foot passengers in January, and soon after for public use. The original cost of Rush Street bridge, including the abutments and piers, is said to have been a little more than \$50,000; and

the cost of the bridge proper, as destroyed, is supposed to have been about \$22,000. The new wooden truss bridge, after deducting for the iron sold from the old bridge, cost \$10,175.46.

On the 29th of February last, we had occasion to report to you that Randolph Street bridge was found to be in an unsafe condition, that the chords were rotten, and that the bridge could not long be used without endangering the lives of persons passing over it. Under your instruction the Board have received bids for a new bridge, and have just let the contract to L. B. Boomer, for \$4,810. There will be some work to be done not included in his contract, which will make the whole cost of the new bridge, with work to be done on the approaches, about \$6,000.

The travel and wear upon the bridges is constantly increasing, and it is evident that the city must be continually adding to the facilities for intercourse between the three divisions of the city. Perhaps at no time during the year was the truth of this statement more generally felt than last fall, after the loss of the Rush Street bridge. The whole traffic across the main river was then thrown on two bridges, those at Clark and Wells Streets, and the wear upon those bridges was so very heavy and incessant, that the Board were continually apprehensive lest one or both of them should receive some material injury, and be thrown out of use.

As long ago as the year 1860, the Council authorized the erection of a bridge across the river at State Street, and the Board have at several times reported to you, recommending its erection as speedily as possible. The most serious difficulty in the way has been that the City has the right of way only on the south side of the river. On the south side, State Street is extended to the river. On the north side, Wolcott street is not extended to the river; there is a small strip of land between the end of the street and the river, owned by the G. & C. U. R. R. Co. Steps have been taken to extend Wolcott Street to the river by assessment and the condemnation of the property, and there have besides been various communications between the Company and the Board with reference to the transfer of the right of way to the City without assessment. It is hoped that the City may speedily get possession of this piece of property needed for the extension of Wolcott Street, and that the bridge will be built early this season.

One way of facilitating the traffic across the river and its branches, will be to replace the old float bridges by pivot bridges. Some of these should be replaced without delay. The bridges at Twelfth Street, Polk Street, Old Street, and Chicago Avenue, ought now to be removed, and pivot bridges substituted for them.

The old bridge across the South Branch at Bridgeport is rotten and unsafe. It should be rebuilt this year, and we shall be obliged to ask for an appropriation for its cost.

## PUBLIC BUILDINGS.

The expenditures of the year have been applied mainly to the engine houses.

Early last year the Board contracted for the building of a new brick engine house on West Lake Street—the Island Queen engine house. The contract was for the taking down of the old building, and the erection of the new one. By its terms the new building was to be wholly finished December 1st, 1863. The contractor has quite failed in completing the building, and from being left so long in an unfinished state, the stability of the walls has been endangered. To save the city from loss, we have been obliged to take the work out of the contractor's hands, and have directed the Superintendent to employ other workmen, and finish the building immediately.

As preliminary steps were being taken for the raising and improving of West Randolph Street, the Board reported to you, last January, that in their judgment the west market building had better be sold and removed. It was of very little public benefit, and was kept in decent condition only at a continually increasing expense. Acting on the report, the Common Council appointed a committee to act jointly with the Board, and your committee and the Board subsequently unanimously agreed to advertise the building for sale and removal. At the appointed time, seventeen different bids were received for the building, ranging from \$375 to \$1,600. None of these bids were accepted by the Board, and proposals having been again invited, the building was finally sold to Henry Fuller, the highest bidder, for \$2,500. It has since been taken down by him and removed.

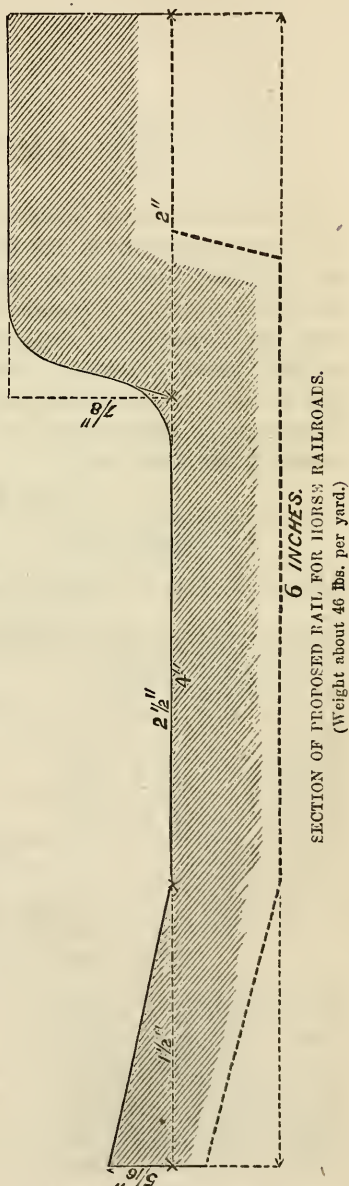
## PUBLIC PARKS AND CEMETERY.

But little was done, during the year, on the parks and cemetery. For the parks of the South and North Divisions no appropriations were made, and the Board have been without the means even of repairing their fences, or of keeping the cattle out of them. For the cemetery the small appropriation of \$500 hardly paid the hire of the gate keeper.



## FORM OF RAIL FOR HORSE RAILROADS.

In conjunction with a committee of your body, the Board have taken a great deal of pains to determine a pattern for rails to be used on our street railroads, which shall seem best for general adoption throughout the city. The aim was to get a kind of rail which ordinary vehicles could travel along and cross easily, and one which, when laid in a street, should cause the least possible interference with the common use of the street. Inquiries were made as to the kinds of rail in use in other cities, and suggestions founded on their experience were asked for. A good deal of information was thus obtained, and the conclusion finally reached by the Board was, that the best rail for use in our city would be one having a flange four inches wide, on which ordinary vehicles might run, with a rise of not more than seven-eighths of an inch from the flange to the highest part of the rail along which roll the wheels of the horse cars. It was also thought that it would assist in driving out of and across the track to have the inner edge of the rail slightly raised above the flat part of the flange, say five-sixteenths of an inch, the rail being of the form shown by the accompanying sketch. Even with the best form of rail, the track must be maintained in good condition, and level with the surface of the street, or it will become a serious annoyance.



It may be well to remark, that the gauge of all our horse railroads is  $4' 8\frac{1}{2}"$ , and that the distance from outside to outside of the wheels of the most common vehicles, such as buggies and farm wagons, is very nearly the same, averaging, for such vehicles,  $4' 8"$ .

## LAMP POSTS.

The extent of streets lighted by the city was largely increased during the year, particularly in the West Division, where a large amount of new pipe had been laid by the People's Gas Light & Coke Company. We give below a list of streets ordered by you to be supplied with lamp posts, and a statement of the progress made in carrying out the various orders. In some cases lamps have been ordered where there is no gas pipe in the street, and as the gas companies do not appear to be required to lay the pipe where ordered by the city, in such cases it will not be possible to erect the lamps.

## SOUTH DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Harmon court, State st. to Michigan avenue.	2	No pipe State st. to Wabash av. 1 to be erected.
Prairie av., Monterey (24th) to Buena Vista (25th)	4	Lamps all erected.
Michigan av., B. Vista (25th) to Rio Grande (26th)	5	" "
Grove st., 18th st to 19th st.	4	" "
18th st., State st. to Grove st.	16	Lamps all erected.
Clark st., 12th st. to 18th st.	26	Nothing done. No pipe laid.
Jackson st., Clark st. to La Salle st.	3	" "
Archer road, State st. to Lock st.	66	" "
Michigan av., 18th st. to 22d st.	11	" "
Van Buren st., Wells st. to Market st.	7	" "
4th av., 12th st. 400 feet south.	3	" "
Indiana av., from 60 ft. south of 25th st. to 60 feet north of 29th st.	10	Assessment being made.

## WEST DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Aberdeen st., Monroe st. to Adams st.	4	Two lamps erected.
Adams st., Canal st. to Halsted st.	16	Six " "
Warren st., Reuben st. to Robey st.	20	Fourteen lamps erected.
St. John's place, Lake st. to Fulton st.	3	Two " "
Peoria st., Randolph st., to Lake st.	2	Lamps all erected.
Mather st., Canal st. to Jefferson st.	6	" "
Fulton st., Peck st. to Reuben st.	5	" "
Jefferson st., Harrison st. to Polk st.	6	" "
Jackson st., Throop st. to Loomis st.	4	" "



## LAMP POSTS.—CONTINUED.

## WEST DIVISION. Continued.

WHERE ERECTED.	No. Posts	REMARKS.
Loomis st., Jackson st. to half way bet. Van Buren st. and Tyler st.	6	Lamps all erected.
Sangamon st., Van Buren st. to Tyler st.	5	No pipe in the street.
Taylor st., Canal st. to Jefferson st.	7	Four lamps erected.
Polk st., Canal st. to Foster st.	10	Lamps all erected.
Clinton st., Maxwell st. to Polk st.,	24	" "
Sheldon st., Randolph st. to Washington st.	2	" "
Adams st., Rucker st. to within 250 ft. of Morgan.	8	Seven lamps erected.
Park av., Paulina st. to Reuben st.	4	Lamps all erected.
Lincoln st., Hubbard st. to Fulton st.	10	No pipe in the street.
Lake st., Paulina st. to Leavitt st.	25	
Judd st., Canal st. to Jefferson st.	7	Lamps all erected.
12th st., Clinton st. to Jefferson st.	3	" "
Fulton st., Robey st. to Lincoln st.	3	No pipe in the street.
Wood st., Hubbard st. to Lake st.	14	" "
Hubbard st., Wood st. to Lincoln st.	3	" "
Monroe st., Canal st. to Halsted st.	14	
Canal st., Old (18th) st. to North (16th) st.	7	No pipe in the street.
Old (18th) st., Canal st. to Chicago river.	8	" "
Robey st., Fulton st. to Lake st.	4	" "
Carpenter st., Kinzie st. to Carroll st.	3	Two lamps erected.
Sangamon st., Carroll st. to Fulton st.	2	Lamps all erected.
Carroll st., Halsted st. to Carpenter st.	15	" "
Fulton st., Sangamon st. to Morgan st.	3	" "
12th st., Blue Island av. to Rucker st.	7	" "
Depuyster st., to a point 450 ft. west of Desplaines.	3	" "
Jackson st., Halsted st. to Desplaines st.	5	" "
Carroll st., Halsted st. to Desplaines st.	5	No pipe in the street.
Halsted st., Fulton st. to Milwaukee av.	10	Lamps all erected.
Desplaines st., Harrison st. to 250 ft. north of Adams	16	" "
Van Buren st., Halsted st. to Desplaines st.	4	" "
Price place, Desplaines st. to Halsted st.	4	" "
Throop st., Van Buren st. to Jackson st.	3	Assessment being made.
Washington st., Wood st. to Lincoln st.	4	" " "
West Water st., Kinzie st. to Indiana st.	7	" " "
Willard place, Randolph st. to Washington st.	2	Lamps all erected.
Blue Island av., Maxwell st. to Mitchell st.	6	" "
Van Buren st., Sangamon st. to 175 ft. w. Morgan.	4	" "
Jefferson st., Ewing st. to Polk st.	2	" "
Adams st., from 347 feet west of Throop st. to Laflin	7	No pipe in the street.

## NORTH DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Oak st., Green Bay st. to Lake Michigan.	3	Nothing done.
Chicago av., Rush st. to Pine st.	1	Lamp erected.
N. Dearborn st., Maple st. to Division st.	4	Two Lamps erected.
Chicago av., Wolcott st. to Green Bay st.	6	Lamps all erected.
Cass st., Superior st. to E. Hinsdale.	5	Nothing done.

## ACCOUNTS.

We present herewith various financial statements, showing in detail all the expenditures, and the cost of the various operations conducted by the Board during the year.

Respectfully submitted.

J. G. GINDELE,	} <i>Board of Public</i>	
FRED. LETZ,		} <i>Works.</i>
O. J. ROSE,		
F. C. SHERMAN.		

## REPORT OF CITY ENGINEER.

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CHICAGO, April, 1864.

*To the Board of Public Works :*

GENTLEMEN—The City Engineer herewith respectfully presents this, his third annual report.

### WATER WORKS.

These are generally, with regard to repairs and efficiency, in as good a condition as they were a year ago—in some respects better.

### PUMPING WORKS.

The condition and performance of these, during the past year, will be found fully described in the following report of the engineer in charge of them.

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## REPORT OF ENGINEER OF PUMPING WORKS.

ENGINE HOUSE PUMPING WORKS, }  
CHICAGO, April, 1, 1864. }

E. S. CHESBROUGH, ESQ., City Engineer :

SIR :—Agreeable to the usual custom, I herewith present a statement of the operations of this department for the year ending March 31st, 1864.

On the 24th of November last the water was shut off for the purpose of cleaning the pump well, which occupied about three hours. During this time the reservoirs were full of water, and watchmen were stationed at each for the purpose of opening the gates in the event of a fire occur-

ring in the city. With this exception, the supply of water to the city has been constant throughout the past year.

The quantity pumped during the year just closed amounts to 2,336,-108,454 U. S. gallons, and exceeds the quantity pumped the previous year 118,828,715 gallons.

Of the whole amount delivered, the

Large engine pumped.....1,177,627,536 gals.  
 Small do do .....1,158,480,918 "  
 Being an average daily quantity of..... 6,382,810 "

The following tabular statement exhibits the aggregate operation of both engines, etc., during the past year:

MONTHS.	Average Gallons Water pumped per day.	Total Gallons Water pumped per month.	Average lbs. of Coal consumed per day.	Total lbs. of Coal consumed per month.
1863.				
April, .....	5,783,989	173,519,952	15,309	459,288
May, .....	6,229,656	193,119,348	15,567	482,590
June, .....	6,475,190	194,255,701	14,881	446,458
July, .....	6,752,667	209,332,677	15,508	480,750
August, .....	7,018,136	217,561,920	14,722	556,393
September, .....	7,240,989	217,229,652	17,484	524,538
October, .....	5,989,613	185,678,001	17,955	456,618
November, .....	5,871,086	176,132,600	13,655	409,660
December, .....	6,438,474	199,592,696	15,774	488,995
1864.				
January, .....	6,770,451	209,884,992	17,389	539,088
February, ... ..	6,072,022	176,088,647	14,725	427,050
March, .... ..	5,926,202	183,712,268	14,313	443,715

## THE FOLLOWING TABLE SHOWS THE QUANTITY OF WATER PUMPED EACH MONTH,

*From January 1st, 1858, to March 1st, 1864, inclusive.*

MONTHS.	1858.	1859.	1860.	1861.	1862.	Months.	1863.	1863-4.
January, ..	81,538,179	106,905,665	132,284,454	137,651,918	151,971,047	April,	.....	173,519,952
February, .	69,426,515	106,401,412	130,800,720	142,071,067	168,931,783	May,	.....	193,119,348
March, ....	82,677,463	102,415,983	150,331,680	135,576,447	192,937,942	June,	.....	194,255,701
April, .....	82,600,782	89,994,235	132,930,546	128,371,178	170,081,570	July,	.....	209,332,677
May, .....	82,279,920	116,007,263	141,171,078	150,489,168	181,483,032	Aug.	.....	217,561,920
June, .....	90,211,505	113,098,416	148,197,024	155,996,352	199,113,518	Sept.	.....	217,229,652
July, .....	101,070,736	133,800,336	166,394,640	147,182,793	209,215,872	Oct.	.....	185,678,001
August, ...	107,176,652	123,266,556	152,427,690	168,602,494	195,588,295	Nov.	.....	176,132,600
September.	108,534,540	131,735,847	132,272,202	152,710,186	186,902,888	Dec.	.....	199,592,696
October, ...	101,046,605	141,527,040	148,710,195	149,362,166	199,045,045	Jan.	169,900,255	209,884,992
November, ..	86,385,840	127,342,018	150,493,248	153,879,648	187,002,720	Feb.	158,108,450	176,088,647
December, ..	98,316,722	122,653,139	130,773,075	145,261,272	175,006,027	Mar.	159,930,404	183,712,268
TOTAL, ...	1,091,865,457	1,415,147,910	1,716,786,552	1,767,154,689	2,217,279,739		487,939,109	2,336,108,454

NOTE.—The operating year is now (1863) from first of April.

## THE AVERAGE DAILY QUANTITY PUMPED FOR THE ABOVE YEARS, WAS:

1858, .....	2,991,412	galls.	1861, .....	4,841,547	galls.
1859, .....	3,877,118	"	1862, .....	6,074,739	"
1860, .....	4,703,525	"	1863-4, .....	6,382,810	"

## THE PUMPING ENGINES

Have been in use a portion of every day during the past year.

The large engine has been in operation 179 days, an average of  $15\frac{1}{2}$  hours per day.

The small engine 187 days, an average of  $18\frac{3}{4}$  hours per day.

The actual running time amounts to  $6,099\frac{3}{4}$  hours.

The whole amount of coal received during the year was  $3,694\frac{1}{2}$  tons, in addition to  $173\frac{5}{8}$  tons on hand April 1st, '63, making a total of  $3,868\frac{1}{8}$  tons. Of this amount  $2,857\frac{1}{2}$  tons were consumed for pumping,  $124\frac{250}{2000}$  tons for keeping steam when the engines were at rest,  $148\frac{1175}{2000}$  tons for pipe laying, workshop, inlet, heating engine house, &c.; making a total for all purposes of  $3,130\frac{568}{2000}$  tons; and leaving on hand, April 1st, '64,  $759\frac{1030}{2000}$  tons.

The following tables will show in detail the operations of engines, pumps and boilers during the past year:

## LARGE ENGINE.

MONTHS.	No. of Days run.	No. of Hours and Minutes run.	Av. No. of Hours run per day.	Av. galls. of water pumped per day.	Total galls. water pumped per month.	Pounds Coal consumed for pump'g.	Pounds Coal consumed when at rest.	Total Coal used pr month.	Total Revolutions per month.
1863.		H. M.	H. M.						
April,.....	30	420 41	14 01	5,783,989	173,519,952	459,288	27,500	486,788	212,647
May,.....	20	293 44	14 41	6,185,973	123,719,472	317,970	17,100	335,070	151,617
June,.....	5	66 14	13 15	5,586,825	27,534,128	69,580	3,100	72,680	34,233
July,.....	5	73 55	14 47	6,559,499	32,797,488	82,590	3,900	86,490	40,193
August, ...	31	501 15	16 10	7,018,138	217,561,920	556,393	24,000	580,393	266,620
September,.....	21	342 50	16 19	7,614,640	159,907,440	387,973	15,100	403,073	195,965
December,.....	28	402 36	14 22	6,395,079	179,062,224	443,195	26,500	469,695	219,439
1864.									
January,.....	31	467 30	15 04	6,770,451	209,884,092	539,088	27,300	566,388	257,212
February,.....	8	117 09	14 38	6,654,990	53,239,920	135,140	6,500	141,640	65,245
TOTALS,.....	179	2,685 54	14 48	6,467,192	1,177,627,536	2,991,217	151,000	3,142,217	1,443,171



## SMALL ENGINE.

MONTHS.	No. of days run.	No. of hours and Minutes run.	Av. No. of Hours run per day.	Av. galls of water pumped per day.	Total galls. water pumped pr month.	Pounds Coal consumed for pump'g.	Pounds Coal consumed when at rest.	Total Coal used per month.	Total Revolutions per month.
1863.		H. M.	H. M.						
May, .....	11	216 21	19 40	6,309,079	69,399,876	164,620	4,800	169,420	133,770
June, .....	25	490 32	19 37	6,652,862	166,321,573	376,878	10,600	387,478	320,589
July, .....	26	496 33	19 06	6,789,814	176,535,189	398,160	10,500	408,660	340,276
September, .....	9	166 12	18 28	6,369,134	57,322,212	136,565	4,600	141,165	110,490
October, .....	31	556 56	17 57	5,989,613	185,678,001	456,618	15,900	472,518	357,899
November, .....	30	510 15	16 42	5,871,086	176,132,600	409,660	17,500	427,160	339,500
December, .....	3	57 02	19 00	6,843,490	20,530,472	45,800	2,550	48,350	39,573
1864.									
February, .....	21	367 50	17 31	5,849,939	122,848,727	291,910	12,300	304,210	236,794
March, .....	31	551 46	17 47	5,936,262	183,712,268	443,715	18,500	462,215	354,110
TOTALS, .....	187	3,413 30	18 25	6,195,085	1,118,480,918	2,723,926	97,250	2,821,176	2,233,001

## RECAPITULATION.

ENGINES.	No. of Days.	No. of Hours and Minutes.	Total galls. water pumped.	Pounds Coal consumed for pump'g.	Pounds Coal consumed when at rest.	Total pounds of Coal used.	Total No. of Revolutions.
		H. M.					
Large, .....	179	2,685 54	1,177,627,536	2,991,217	151,000	3,142,217	1,443,171
Small, .....	187	3,413 30	1,158,480,918	2,723,926	97,250	2,821,176	2,233,001
TOTAL, .....	366	6,099 24	2,336,108,454	5,715,143	248,250	5,963,393	3,676,172

The actual expenses due to pumping during the past year were as follows:

Salaries of engines and firemen, .....	\$ 5,445.88
3,043 $\frac{710}{2000}$ tons of coal for pumping, heating engine house, } &c. at an average of \$6.53 per ton, .....	\$19,879.74
229 gallons oil, .....	211.09
843 pounds tallow, .....	89.92
Packing, waste, etc, .....	185.71
Gas for lighting works, .....	144.43
Repairs to machinery, .....	40.86
Total, .....	\$25,997.63

Cost of delivering water per million gallons, .....

\$11.72

The engines and boilers are in as good condition as circumstances will permit. Nothing more than the usual repairs by the regular employees has been done during the past year, with the exception of slight repairs upon the "North Boiler," costing \$6.53, and the completion of the foot-walks around the small engine, costing \$340.72; this latter work, however, is not properly repairs.

There are some important parts of the large engine which require repairs. These will receive attention as soon as the parts can be procured. Owing to the peculiar arrangement of the works, it has been deemed best to replace some of the parts needing repairs with new ones. A new steam piston has therefore been ordered, and will be connected early the coming year. The old piston, when repaired, will be fit for use hereafter.

The purpose for which these engines were erected is of such vital importance to the community, that no effort should be spared to secure them beyond the probability of failure. For it is upon the pumping works that the city is almost wholly dependent for a supply of water. This becomes apparent when the fact is taken into consideration that the reservoirs are of such limited capacity they would be of little service in the event of an accident to the engines. However, as there are two independent engines, it would seem that there is sufficient security against a contingency of the kind. No doubt this was the object in view of those who designed the works, since it was intended to use but one engine at a time, the other to be kept as a reserve.

The past ten years have fully demonstrated the wisdom of this arrangement. But are the measures heretofore relied upon, adequate for the future? Perhaps a brief review of the operation and condition of the engines, may aid to determine the question. It will be recollected the small engine has been in use for ten years; during this time but little repairs have been found necessary, and its performance has been every way satisfactory. Thirteen revolutions per minute is the limit to which this engine was designed to run. At that rate, for twenty-four hours, about nine and a half millions gallons of water could be pumped.

During the past year it was found necessary to run this engine several days, over eleven revolutions per minute for twenty-four hours per day, and during one day over twelve revolutions per minute were made for nineteen hours, and the quantity of water required to be pumped, reached seven and a half million gallons per day. Thus it will be seen the nominal maximum capacity of this engine is nearly reached. Although these requirements during the past year were an exception, yet with a



reasonable increase in the consumption of water during the next two years, they will certainly become the rule. And to impose upon machinery a greater duty than it was designed for, is generally a hazardous experiment. This would seem especially true where a whole community are dependent upon the successful operation of it, as is the case with our pumping engines.

The capacity of the large engine is fully equal to the demands, but as previously stated, repairs are needed which will require several days to complete, during which, the small engine is the only reliance. It is not apprehended that anything will occur to prevent making these repairs, or interrupt the supply of water. It is alluded to simply to show the necessity that exists for additions, to render the works more reliable. Much more might be submitted upon this subject, but perhaps a comparison of these works with other works of like character, will make it sufficiently apparent.

In nearly all cities where the supply of water is obtained by means of pumps, there are two or more independent engines, each of a capacity to supply the demand. *In addition* to these, there are one or more *immense reservoirs*, containing sufficient water to supply several days or weeks, without using the machinery; thus affording ample time to make important repairs, and thereby render the works reliable.

And notwithstanding these comparatively great sources of security, it will be found, by referring to the various water works reports, that those on whom the duty devolves are continually recommending improvements and additions to their respective works which may tend to insure an abundant and reliable supply of water to their citizens. It therefore seems clear, by the comparison, that either the measures adopted in most cities for a reliable supply are unnecessarily great, or the facilities Chicago at present possesses are insufficient.

It will be borne in mind that our city has *no great reservoir*; it is this important adjunct, or its *equivalent*, that is required to render our pumping works equal in efficiency to any in the United States, for I know of no engines in operation of a more reliable character than those of our own works.

It is obvious, then, that a new engine and pumps will soon be indispensable, *not* as a substitute for either of the present ones, but to increase their usefulness, and also to render the probability of failure less liable. If this be admitted, then the important questions to be

decided are, what shall be the general plan of engine and pumps? and, (perhaps the most important one at this time,) where can machinery of the character required be procured? for it is well known that most of the large foundries in the country are fully occupied with work for the United States government. It may therefore prove a very unfavorable time at present to secure work of the kind. However, I respectfully suggest that the matter receive an early consideration, as much time will be required to thoroughly consider plans for the construction and introduction of new machinery, and when perfected, it is hoped no difficulty will be then experienced in obtaining favorable propositions for its construction.

With this view, and in order that the Board might avail themselves of the experience of others, should additional machinery be deemed necessary, they instructed me to visit a number of pumping works in eastern cities, for the purpose of procuring such information pertaining to the subject as might assist them to determine upon the most desirable plan for a thorough and economical engine and pumps. Accordingly, during the latter part of the year just closed, I visited the pumping works of Jersey City, Brooklyn, Cleveland, Philadelphia, Harrisburg, Detroit, and other places, and was enabled to make observations and gain information which may prove advantageous in the preparation of plans, etc.

In this connection, I desire to avail myself of the present opportunity to acknowledge my obligations to the gentlemen connected with the works above mentioned, also to H. R. Worthington and M. Coryell, of New York City, and R. W. Hamilton, of Hartford, for the very kind manner in which they extended to me every facility to obtain the information sought for.

#### THE BUILDINGS

Of the pumping works are in as good condition as usual. The repairs recommended by you last year were deferred, as additions may be required hereafter which will involve considerable alterations, including that portion requiring repairs.

The recent improvement of the grounds, in front of the buildings, remain permanent. The trees, grass, etc., together with the substantial iron fence and stone sidewalk, render them both attractive and ornamental.

## THE WORKSHOP,

Established two years ago, has, during the past year, given further practical evidence of its usefulness, not only in the quality and quantity of the work "turned out," but in a pecuniary sense.

During the past year, 131 new fire hydrants have been manufactured, besides a number of old ones repaired. Eighty-six stop valves have also been made, of various sizes, as follows :

49 four inch,	5 eight inch,
30 six inch,	2 twelve inch.

In addition to these, 261 feet of wrought iron fence has been constructed for the West Reservoir lot, and a large amount of repairing done for the various bridges and sundry city departments.

The total expenditures for labor and material dur-

ing the year amount to - - - - -	\$7,524.19
Add for interest, wear and tear, etc., - - -	275.00
Value of work as above, based on prices formerly paid for like articles, - - - - -	\$11,260.13
Leaving balance in favor of shop of - - -	3,460.94
	<hr/>
	\$11,260.13 \$11,260.13

Five new hydrants, seven new 6-inch stop valves, one new 8-inch stop valve, and two new 12-inch stop valves remain on hand. The value of the above, including the raw material on hand, amounts to

	\$1,451.43
Value of shop tools, etc., - - - - -	1,719.00
	<hr/>
Total, - - - - -	\$3,170.43

The stores and tools belonging to pumping works are about the same as at date of last report, except those remaining from what were purchased during the past year, which amount to \$156.23. Among the property remaining at the pumping works, is the non-condensing pumping engine formerly used for supplying this city. This engine is horizontal, substantially constructed. The steam cylinder is eighteen inches diameter and six feet stroke. The water pump is double-acting, and same

size as steam cylinder. Connected to it are all the necessary steam, exhaust, suction, and delivery pipes, cocks, valves, etc., etc., making it complete (except boilers) to supply 50,000 people with water. Slight alterations will render this engine available for any purpose where a steam engine of its power may be required. As the city has no further use for it, it might be disposed of at a low figure. I therefore respectfully suggest that it be offered for sale.

No change has been made in the force employed in this department during the past year. It affords me pleasure to state that the assistant engineers, fireman, and others, are entitled to credit for the manner in which they have discharged their various duties.

Respectfully,

DEWITT C. CREGIER, *Engineer.*

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Mr. Cregier's opinion relative to the importance of immediately taking measures to get up plans for a new engine, the necessity for which he has mentioned, both by stating the fact that the reliable maximum capacity of our small engine must in all probability soon be reached, and by referring to the experience and works of other cities, is worthy of serious consideration.

It will be seen, from Mr. Cregier's tables, that the average annual increase of consumption since 1858, has been 559,752 gallons. The greatest number of gallons pumped by the small engine on any day since April 1st, 1863, was 7,554,045 gallons. If the small engine should be worked at a speed of thirteen revolutions per minute for 24 hours, it would deliver 9,714,936 gallons, showing that in less than four years we are likely to reach a point when we may occasionally be obliged to work the small engine at a greater speed than was guaranteed by the contractors for the small engine when new—ten years ago.

There are other reasons, however, why no time should be lost in getting up plans for another engine, beyond what is necessary for a judicious investigation of the merits of different forms and proposed improvements. The most important are, first, the *possibility* that one of the engines may break or some of its parts fail, while the other is undergoing ordinary repairs or overhauling; under such circumstances the city must necessarily be deprived of water for at least two days. Accidents may be caused by influences outside of the pumping works, and over which the engineer has no control, such as the sudden bursting of a large main. Other cities provide against such a contingency by constructing large



reservoirs, at suitable elevations, but our circumstances are such that we shall probably never have a reservoir sufficient to hold two days' supply within the limits of the city, for the reason that such a reservoir would cost at least five times as much as new pumping works, and would not be half their value to the city. The second reason is, the uncertainty that the future increase of consumption and waste can be kept within the limits experienced during the past three years. The average daily amount of water pumped during the year exceeds that of the year before by only 308,071 gallons, while the increase in population and the consequent causes of consumption have been greater than usual. This result is no doubt owing very much, if not wholly, to the more thorough examination of the premises of water tenants, and the consequent prevention of waste from them; to the large number of leaking fire hydrants that have been taken out and renewed or repaired; and to the further extension of the use of meters.

#### THE BASIN.

The breakwater around the basin shows considerable deterioration, and may soon require very extensive repairs or partial renewal.

#### DISTRIBUTING PIPES.

There have been laid, during the year ending March 31, 1864, the following distributing pipes, viz.:

#### SOUTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diamet'r in inches	Length in feet.
Wabash avenue.....	Twenty-fourth and Twenty-second.....	6	825
Butterfield .....	Eighteenth and Nineteenth .....	4	441
Twenty-first .....	Clark and State .....	8	798
Michigan avenue....	Twenty-second and northward.....	6	299
State.....	Twenty-third and Twenty-fourth .....	8	363
Michigan avenue ...	Twenty-fifth and Thirty-first.....	6	3,302
Thirty-first.....	Michigan avenue and Cottage-Grove avenue..	6	2,707
Grove .....	North street and northward.....	4	287
North .....	Indiana avenue and Prairie avenue.....	4	483
Archer road.....	Halsted and Main.....	6	2,537
Polk.....	Clark and State .....	8	846
Hubbard.....	Michigan avenue and State .....	8	855
State.....	Hubbard court and Polk .....	8	316
Wentworth avenue..	Alexander and southward.....	4	373
	Hydrants .....	4	134
Total.....			14,566
The 4 inch pipe on Polk street, between Third and Fourth avenues was taken up when the 8 inch main was laid last year.....			280
Difference.....			14,286

## DISTRIBUTING PIPES.—CONTINUED.

## WEST DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diamet'r in inches	Length in feet.
Washington.....	Wood and Lincoln .....	4	710
Maxwell.....	Jefferson and Newberry.....	6	1,601
Twelfth.....	Canal and Union .....	8	1,624
Morgan.....	Hubbard and Kinzie.....	4	371
Jefferson.....	Hubbard and Indiana.....	4	379
Morgan.....	Harrison and Polk.....	8	300
Harrison.....	Morgan and Morgan.....	8	140
Morgan.....	Polk and Taylor .....	8	1,086
Twelfth.....	Canal and Lumber.....	6	1,133
North.....	Union eastward to end of pipe laid last year..	6	1,106
Union.....	North and northward.....	4	129
Jefferson.....	North and southward.....	6	50
Reuben.....	Chicago avenue and Cornell.....	6	666
Chicago avenue.....	Carpenter and Reuben.....	6	3,649
Holt.....	Chicago avenue and northward.....	4	48
Rose.....	Chicago avenue and northward.....	4	47
Noble.....	Chicago avenue and northward.....	4	49
Chase.....	Chicago avenue and northward.....	4	46
Rucker.....	Chicago avenue and northward.....	6	52
Wright.....	Jefferson and Halsted.....	6	1,344
Canal.....	Canalport avenue and Old street.....	6	142
Old.....	Canal and eastward.....	6	482
Cornell.....	Reuben and Rose.....	4	1,017
Rose.....	Cornell and Front .....	4	357
Front.....	Reuben and Rose .....	4	1,018
Holt.....	Front and northward.....	4	193
Rucker.....	Jackson and Adams.....	4	250
Throop.....	Jackson and Tyler.....	6	888
Mather.....	Halsted and eastward .....	4	437
Arthur.....	Old and Irwin.....	4	476
Irwin.....	Canal and Arthur.....	4	324
May.....	Polk and Twelfth.....	4	1,726
Newberry.....	Maxwell and Wright.....	4	893
Twelfth.....	Blue Island avenue and Rucker street.....	8	937
Rucker.....	Twelfth and southward .....	6	50
Mitchell.....	Stewart avenue and eastward.....	4	418
Barber.....	Canal and Stewart avenue.....	4	566
Meagher.....	Canal and Stewart avenue.....	4	537
Lincoln.....	Park avenue and Lake street.....	6	345
Lake.....	Lincoln and Leavitt.....	4	2,019
Lumber.....	Twelfth and Maxwell.....	4	779
Canalport avenue ..	Seward and Jefferson .....	6	618
Jefferson.....	Canalport avenue and Lumber.....	6	1,483
Lumber.....	Jefferson and Union .....	4	1,165
Fulton.....	Peck and Reuben.....	4	745
St. John's place.....	Fulton and Lake .....	4	276
Fulton.....	Morgan and Curtis.....	4	660
Curtis.....	Lake and Fulton .....	4	404

Amount carried forward..... 33,735



## DISTRIBUTING PIPES.—CONTINUED.

## WEST DIVISION. Continued.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches	Length in feet.
	Amount brought forward.....		33,735
Ewing.....	Jefferson and Halsted.....	4	1,308
Beach.....	Polk and Taylor.....	4	859
Union.....	Barber and Catharine.....	4	458
Robey.....	Lake and Walnut.....	4	327
Peoria.....	Hubbard and Milwaukee av.....	4	983
Indiana.....	Milwaukee avenue and eastward.....	4	543
Pratt.....	Milwaukee avenue and Sangamon.....	4	563
Sangamon.....	Milwaukee avenue and Pratt.....	4	521
Sangamon.....	Kinzie and Prairie.....	4	477
Curtis.....	Hubbard and Kinzie.....	4	400
Foster..	Harrison and Polk.....	4	865
Hope....	Blue Island avenue and Morgan..	4	688
Better.....	Sholto and May.....	4	560
Carpenter.....	Chicago avenue and Front.....	4	360
	Hydrants.....	4	435
Total.....			43,082

## NORTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches	Length in feet.
Division.....	Halsted and Larrabee.....	6	1,320
Halsted.....	Division and Rees.....	4	1,010
Elm.....	Green Bay and eastward.....	4	220
Pearson.....	Franklin east of Wells.....	4	672
Sigel.....	Sedgwick and Hurlbut.....	4	650
Otis.....	Division and Vedder.....	4	507
Goethe.....	Wells and Clark.....	4	838
Huron.....	Wolcott and Cass.....	6	376
Huron.....	Townsend and Kingsbury.....	4	393
Erie.....	Wolcott and Cass.....	4	374
Halsted.....	North avenue and Willow.....	6	1,080
Willow.....	Halsted and westward.....	4	238
Burling.....	Willow and North avenue.....	4	1,087
Elm.....	Wells and eastward.....	4	263
Whiting.....	Franklin and west of Market.....	4	638
Green Bay road.....	Asylum place and Cane street.....	4	365
Cane.....	Green Bay road and westward.....	4	281
Vine.....	Division and Vedder.....	4	483
Ontario.....	Market and westward.....	4	460
	Hydrants.....	4	68
Total.....			11,323

The total length of pipe laid in the whole city during the year was 13 miles and 331 feet. The length taken up was 280 feet.

The total length of pipe of different sizes, in the city, as near as can be ascertained, is as follows, viz. :

24	inch	cast iron main pipe, - - - -	12,265	feet.
16	"	" " " " - - - -	10,610	"
12	"	" " " " - - - -	9,830	"
30	"	wrought iron river pipe, State street, -	280	"
24	"	" " " " Chicago avenue, -	236	"
24	"	" " " " Rush street, -	530	"
12	"	" " " " Adams street, " -	176	"
12	"	cast iron distributing pipe, - - - -	364	"
10	"	" " " " - - - -	7,862	"
9	"	wrought iron distributing and siphon pipe, Archer road, - - - -	90	"
8	"	cast iron distributing pipe, - - - -	47,318	"
6	"	" " " " - - - -	199,725	"
4	"	" " " " - - - -	303,027	"
3	"	" " " " - - - -	30,388	"
				<hr/>
				622,701 feet.

or 117 miles and 4.941 feet.

It will be seen, from the above statement, that there is a greater length of 4-inch pipes than of all larger sizes put together. It was found advisable, years ago, to lay no more 3-inch pipes; and if the experience of other cities, as well as our own, with regard to the supply of fire engines, should be carefully considered, it may be found best to lay a much smaller proportion of 4-inch pipes in future. With iron at ordinary prices, the saving, by laying 4-inch instead of 6-inch pipes, is only thirty cents a running foot, while the efficiency, when new, of a 4-inch pipe is less than one-half that of a 6-inch pipe; but when old and partially filled with tubercles or deposits, its capacity for delivering water is frequently diminished to one-third that of a 6-inch pipe equally affected with tubercles or deposits.

#### HYDRANTS.

During the year, the following new hydrants have been put in, viz. :

##### SOUTH DIVISION.

1	Cregier, N. W. corner	Twenty-first and State.
1	" N. E. "	Thirty-first and Michigan avenue.
1	" " "	Indiana avenue.
1	" " "	Calumet avenue.
1	" " "	Myrick avenue.

## WEST DIVISION.

1	Cregier,	N. W.	corner	Lincoln	and	West	Washington.
1	"	N. side	Maxwell	between	Jefferson	and	Union.
1	"	N. W.	corner	Kinzie	and	Morgan.	
1	"	N. E.	"	Harrison	and	Morgan.	
1	"	N. W.	"	Twelfth	and	Canal.	
1	"	"	"	Union	and	North.	
1	"	N. E.	"	Chicago	avenue	and	Reuben.
1	"	"	"	"	"	"	Holt.
1	"	"	"	"	"	"	Noble
1	"	"	"	"	"	"	Chase.
1	"	N. W.	"	"	"	"	Rucker.
1	"	"	"	Throop	and	Van	Buren.
1	"	"	"	"	"	"	Tyler.
1	"	"	"	May	and	Twelfth.	
1	"	West	side	May,	opposite	Damon.	
1	"	N. W.	corner	Stewart	avenue	and	Meagher.
1	"	N. E.	"	Lake	and	Robey.	
1	"	"	"	"	"	"	Hoyne.
1	"	N. W.	"	"	"	"	Leavitt.
1	"	Engine	House,	north	side	Jackson	bet. Clinton and Jefferson.
1	"	"	"	"	"	Blue	Is. av. bet. Harrison & Gurley.
1	"	N. W.	corner	Desplaines	and	Ewing.	
1	"	"	"	Peoria	and	Indiana.	
1	"	S. W.	"	Sangamon	and	Pratt.	
1	"	N. W.	"	"	"	"	Kinzie.
1	"	"	"	Curtis	and	Kinzie.	
1	"	S. W.	"	Carpenter	and	Front.	
1	"	North	side	Cornell	opposite	Rose.	
1	"	West	side	Reuben	"	"	Cornell.
1	"	N. E.	side	Beach	"	"	Ewing.
1	"	S. E.	side	Beach	"	"	Taylor.

## NORTH DIVISION.

1	Cregier,	N. E.	corner	Sigel	and	Hurlbut.
1	"	"	"	Huron	and	Kingsbury.
1	"	N. W.	"	Halsted	and	Willow.
1	"	N. E.	"	Division	and	Pleasant.

In all 40, making the total number in and belonging to the city at this time, 548.

Sixty-three hydrants were taken out and renewed, all with Cregier's; besides these, twelve other hydrants received more or less repairs.

About one hundred hydrants have been connected with the sewers in such a way as not only to drain off waste and leakage from them, but to let warm air from the sewers circulate around them. Although the operation of thawing out hydrants was performed 334 times last winter, but one hydrant that was connected with the sewers was frozen, and that was owing to the drain pipe having been obstructed. This is satisfactory evidence of the importance of continuing this work as far as the sewers have been built.

### STOP COCKS.

The following stop cocks have been put in during the year, viz.:

#### SOUTH DIVISION.

1	W. Wks. shop	8 in.,	Clark, south side of Twelfth.
1	"	8 in.,	Twenty-first, east side of Clark.
1	"	6 in.,	Archer road, west side of Halsted.
1	"	4 in.,	Prairie avenue, south side of North.
1	"	8 in.,	Polk, east side of Clark.

#### WEST DIVISION.

1	W. Wks. shop	4 in.,	West Washington, west side of Lincoln.
1	"	4 in.,	Morgan, north side of Kinzie.
1	"	8 in.,	Morgan, south side of Taylor.
1	"	6 in.,	Jefferson, south side of North.
1	"	6 in.,	Reuben, north side of Chicago avenue.
1	"	4 in.,	Holt, " "
1	"	4 in.,	Rose, " "
1	"	4 in.,	Noble, " "
1	"	4 in.,	Chase, " "
1	"	6 in.,	Rucker, " "
1	"	6 in.,	Wright, west side of Halsted.
1	"	4 in.,	May, south side of Polk.
1	"	6 in.,	Maxwell, west side of Halsted.
1	"	6 in.,	Rucker, south side of Twelfth.
1	"	4 in.,	Park avenue, west side of Lincoln.
1	"	4 in.,	Lake, west side of Lincoln.

## STOP COCKS.—CONTINUED.

## WEST DIVISION. Continued.

1	W. Wks. shop	6 in., Lincoln, north side of Park avenue.
1	"	4 in., Polk, north side of Beach.
1	"	4 in., Sangamon, north side of Kinzie.
1	"	4 in., Curtis, north side of Kinzie.
1	"	4 in., Carpenter, north side of Chicago avenue.

## NORTH DIVISION.

1	W. Wks. shop	4 in., Larrabee, north side of Division.
1	"	4 in., Halsted, north side of Division.
1	"	4 in., Pearson, west side of Wells.
1	"	4 in., Otis, north side of Division.
1	"	4 in., Erie, east side of Wolcott.
1	"	6 in., Halsted, north side of North avenue.
1	"	6 in., Illinois, west side of Wells.
1	"	4 in., Indiana, west side of Wells.
1	"	4 in., Ohio, west side of Wells.
1	"	4 in., Burling, North avenue.
1	"	8 in., Chicago avenue, west side of Wells.
1	"	4 in., Chicago avenue, west side of Wells.
1	"	4 in., Franklin, south side of Chicago avenue.
1	"	4 in., Sedgwick, south side of Chicago avenue.
1	"	4 in., Chicago avenue and Larrabee (blow off.)
1	"	4 in., Vine, north side of Division.
1	"	4 in., Erie, west side of Wells.

In all 45, and, together with those previously put in, making a total of 298 in the city.

Two stop cocks were repaired, and 23 were entirely renewed by others made at the water works shop, making the total number of stop cocks made at our own shop, and in actual use on the 1st day of April, 1864, 125—of which seven are 8 inch, forty-one are 6 inch, and seventy-seven are 4 inch.

## WORKSHOP.

The work done here, and the estimated saving by it to the city, have already been mentioned by Mr. Cregier. This very satisfactory result, however, does not embrace all the advantages derived from the workshop,

for without it the probability is that the supply of new districts, last season, would have been very much retarded for the want of hydrants and stop cocks, which, owing to the unprecedented demand for all kinds of iron work, could not have been procured in time from the usual source, after it became known they would be wanted.

#### RESERVOIRS.

The repairs of the south reservoir, mentioned in the last annual report, have proved to be entirely successful, in preventing leakage from its bottom, which was formerly so troublesome.

The other reservoirs leak a little more than they used to, but it will not require much labor to repair them, as the principal difficulty appears to be around the ends of some of the tie-rods.

#### QUALITY OF THE WATER.

This has been pretty good during the year, except for a short time during the packing season. Since then, owing to the frequent rains, no complaints have been made of bad water. Should we have continued dry weather during the next summer or fall, or very cold weather and no rain next winter, a recurrence of this evil may be expected. Of the plans proposed for remedying it, the Board have, after much careful investigation, adopted

#### THE LAKE TUNNEL.

Owing to many delays, of various character, the breaking of ground for this work did not take place till the 17th of last month. On that day the work was formally commenced. The iron cylinders, which had been ordered by the Board to protect the land shaft against an influx of very wet sand and gravel known to overlay the clay for about twenty feet, did not arrive till after upwards of two months of detention. The progress since then has been much less than was expected, owing to the troublesome nature of the sand and gravel just mentioned; but the hard clay has been reached, and there is every encouragement now to believe that the work will proceed without serious hindrance from the land shaft. The crib for the outer lake shaft, is to be commenced next. Contractors have made arrangements for the iron cylinders for this, and most of them have already been cast in Pittsburgh. A portion of the



timber for the outer crib is expected in a few days, and the remainder as fast as needed.

In order that nothing of importance in connection with the crib or the gates for controlling the entrance of water into the tunnel, after it is completed, might be omitted, a visit to New York, Boston, and Philadelphia was made in January last, for the purpose of getting further information, and of advising with Mr. Erastus W. Smith, Chief Engineer of the new Harlem Bridge, and the consulting Engineer of the Board for the Lake Tunnel. As usual on such subjects, respectable authorities differed materially as to whether our plans should be modified or not, and if so, how. The general impression made was that our own lake experience was more valuable for our purposes than that of the seaboard, or even that of the European coast, so far as it could be learned from parliamentary and other documents. Some suggestions, however, with reference to strengthening the crib, have been partially adopted, and changes for this purpose, which will add to the cost of the outer crib.

These changes have been made principally for the purpose of being able to replace the loose stones, to be used in weighting the crib, with solid masonry. It should perhaps be mentioned here that the octagonal form of crib, recommended in the report of last year, has given place to the pentagonal form, as being simpler to build, and having angles easier to strengthen.

The cylinder for the outer shaft has been made heavier than was at first recommended. This was done at the suggestion of Mr. Smith, who furnished the plans and specifications for the cylinders embraced in the contract for the tunnel. Mr. Smith has since had plans of the inlet gates for the outer shaft, prepared in detail. These have required much study, as it is necessary that the gates shall be repaired, whenever they may need it, without shutting off the water from the city.

Much has been said with regard to the propriety of making the tunnel six feet in diameter, instead of five, and if the material through which it is to be made should be stiff clay, as there is every reason to believe it will be, there would be no difficulty whatever in making the tunnel even larger.

The reason for recommending a smaller size, was to make the success of the work as certain as possible, in case the most difficult kinds of soil should be met with. To the examples taken from Minard, in his account of tunnels in France, may be added that of the small drift under the Thames, before the commencement of the great tunnel afterwards com-

pleted there. A short notice of this drift will be found on page 42 of the last annual report, and those mentioned by Minard on page 44. A consideration of these cases show the much greater ease with which it is possible to construct a small tunnel than a large one, through difficult soil.

A six-foot tunnel two miles long would deliver, under the different heads of 2, 8, and 18 feet, 29,000,000 ; 58,000,000 ; and 87,000,000 gallons daily. The corresponding quantities for a five feet tunnel would be 19,000,000 ; 38,000,000 ; and 57,000,000 gallons. The velocities would be, for the above quantities, through a five feet tunnel,  $1\frac{4}{10}$ ,  $2\frac{8}{10}$ , and  $4\frac{2}{10}$  miles an hour ; and through a six feet tunnel, 1, 2, and 3 miles an hour.

Supposing, then, that the city had a population of 1,000,000, requiring an average daily supply to each inhabitant of fifty-seven gallons, the six feet tunnel would furnish it with a head of eight feet and an average velocity of two miles an hour, while a five feet tunnel would require a head of eighteen feet, and a velocity of four and one-fifth miles an hour ; showing a very decided advantage in favor of the six feet tunnel, which it would certainly be worth considerable to secure, in view of the probability of the future rapid growth of the city. It should be remembered, however, that there is a *possibility* of meeting with some difficult places ; and that the tunnel, if completed as now specified, would furnish, with a head of eight feet, water enough to supply a population of two-thirds of a million with fifty-seven gallons daily for each inhabitant, or a whole million with the same quantity for each inhabitant, with a head of eighteen feet.\*

#### METERS.

Mr. O. F. Woodford, the Water Assessor, reports the following meters as being now in use :

27,  $\frac{5}{8}$ -inch,  
36, 1-inch,  
27, 2-inch,  
9, 3-inch.

Whole number, 99, all of which are Worthington's patent.

The favorable results obtained from those already in use, continue to justify their rapid extension.

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\* At the time of going to press, July 7th, the land shaft has been completed ; also, about 240 feet of the tunnel, which is five feet in diameter. The rate of progress in June was about eight feet a day. The outer crib has been very much delayed for the want of timber, but will, it is hoped, be put in place next month.

## SEWERAGE.

In consequence of other duties requiring so much of the time of the City Engineer, the principal Assistant has performed nearly all labors connected with the general charge of the construction and superintendence of sewers, and his full reports and suggestions below are submitted as sufficient and satisfactory under this head.

CHICAGO, MARCH 31, 1864.

To E. S. CHESBROUGH, ESQ., *City Engineer* :

SIR—The following report will show the various operations of the Sewerage Department, during the year ending April 1, 1864.

The amount of work in this department, during the past year, exceeds that done for several years past, and amounts to 39,605 lineal feet =  $7\frac{2}{5}\frac{6}{2}\frac{4}{3}\frac{5}{0}$  miles of sewers built. The following tabular statements show the length of the different size sewers built during the year in the three districts, and the total lengths of the same, in the three districts, built up to April 1, 1864, and the number of catch basins and man holes.

LENGTH IN FEET OF SEWERS BUILT TO APRIL 1, 1864.

Diameter in feet.	SOUTH DISTRICT.		NORTH DISTRICT.		WEST DISTRICT.		TOTAL FEET.
	Previous to April, 1863.	From April 1, 1863, to Ap'l 1, 1864.	Previous to April, 1863.	From April 1, 1863, to Ap'l 1, 1864.	Previous to April, 1863.	From April 1, 1863, to Ap'l 1, 1864.	
6	567	852	3,895		1,292		6,606
5	361	1,286	4,761	3,746	17,090	8,372	35,626
4½			2,721		8,795	4,762	16,278
4	1,952		5,498		5,786	755	13,991
3	13,605	2,143	3,828	331	818	795	21,520
2½	19,478	2,811		2,284			24,573
2¼	6,359						6,359
2	20,258		35,143	3,764	31,634	3,373	94,172
1	68,300	481	25,677	1,500	24,270	2,350	122,578
	130,880	7,573	81,523	11,625	89,685	20,407	341,693

Totals,      138,453                      93,148                      110,092       $64\frac{3}{5}\frac{7}{2}\frac{7}{8}\frac{3}{0}$  miles.

## THIRD ANNUAL REPORT OF

## CATCH BASINS AND MAN HOLES.

	Built from April 1, 1863, to April 1, 1864.			Previously Built.	Total.	Average Cost in 1863 & 1864.
	South Dis.	West Dis.	North Dis.			
Catch Basins, .	17	103	72	1,304	1,496	\$43.15
Man Holes, . . .	44	90	71	2,201	2,405	

RETURN OF SEWERS BUILT AND REPAIRS OF SEWERS, FOR THE YEAR ENDING  
APRIL 1, 1864.

LOCALITY.	CONSTRUCTION.									REPAIRS.			
	6 Feet.	5 Feet.	4 Feet.	4 Feet.	3 Feet.	2½ Ft.	2 Feet.	1 ft Pipe	C Basins	Lt. Sewers repaired.	No Bas. rep.	Bas. etc. alt. to grade.	Covers rep. and rene'd.
<b>SOUTH DISTRICT.</b>													
22d st., Calumet to Indiana av. . . . .	852												
22d st., Indiana av. to State . . . . .		1,286											
22d st., State to Clark . . . . .					877								
Michigan av., 12th to 14th . . . . .					1266								
Michigan av., 14th to 16th . . . . .						1406							
Indiana av., 22d to line of 19th. . . . .						1405							
16th, Prairie av. west. . . . .								397					
Alley B 10 Ft Dear Ad. sewer ex . . . . .								84					
Totals in South District. . . . .	852	1,286			2143	2811		481	17	21	3	24	180
<b>WEST DISTRICT.</b>													
Harrison st., river to Halsted. . . . .		3,016											
Twelfth st., river to Halsted. . . . .		3,379											
Maxwell st., river to Canal. . . . .		1,977											
Fulton st., Peck to Reuben . . . . .			674										
Adams st., 216 ft. w of Aberdeen to 306 ft. w of Throop . . . . .			1,418										
Twelfth st., Halsted to Rucker. . . . .			2,670										
North st., Stewart av. to river. . . . .				355									
Reuben st., Fulton to Lake . . . . .				400									
North st., Jefferson to Union. . . . .					795								
Sheldon st., Fulton to Lake . . . . .							448						
Peck st., Fulton to Lake. . . . .							440						
Rucker st., Adams to Monroe. . . . .							486						
Canal st., Twelfth to Judd. . . . .							311						
Canal st., Wilson to Wright. . . . .							1222						
Canal st., Meagher to ally's south . . . . .							240						
Union st., North to alley north. . . . .							226						
Jefferson st., Hubbard to Ind'n'a . . . . .							302						
Monroe st., Rucker east . . . . .							491						
Green st., Monroe to Jackson . . . . .							893						
Canal st., Judd to Wilson. . . . .							255						
Canal st., Wright to Meagher. . . . .							409						
Totals in West District. . . . .		8,372	4,762	755	795		3373	2350	103	78	4	42	75
<b>NORTH DISTRICT.</b>													
Market st., Erie to Division. . . . .		3,526											
Division st., Market to Sedgwick . . . . .		220											
Division st., Sedgwick to Cly. av . . . . .					331								
Chicago av., river to Market. . . . .						1728							
Wolcott st., Chi. av. to Hinsdale . . . . .						556							
Wolcott st., Hinsdale to White. . . . .							314						
Division st., Market to Wells. . . . .							706						
Hinsdale st., Market to Frank'n . . . . .							406						
Elm st., Green Bay to Dearborn . . . . .							369						
Pearson st., Green Bay to Cass. . . . .							253						
White st., Wolcott to Dearborn . . . . .							438						
Chicago av., Markot to La Salle . . . . .							1188						
La Salle st., Erie to Chicago av. . . . .							949						
Franklin st., Hinsdale south. . . . .							146						
Dearborn st., Elm north. . . . .							135						
Alley B 3 Bush'lls Ad. n Chi. av . . . . .							270						
Totals in North District. . . . .		3,746			331	2284	3764	1500	72	30	2	16	31
GRAND TOTALS. . . . .	852	13,404	4,762	755	3269	5095	7137	4331	192	129	9	82	286



There remain to be executed contracts for building the following sewers, and which are now in progress. In the South District, 4,360 feet of 2½ feet sewers, and 3,960 feet of 2 feet sewers. In the West District, 3,770 feet of 2 feet sewers. And in the North District, 1,240 feet of 2 feet sewers.

The average cost of the sewers built during the past year has been considerably greater than of those built in 1860, but less than that of those built in 1856, as is shown below :

6 ft. sewers per lin. ft.,	1856, \$5.76.	In 1860, \$2.88.	In 1863, \$0.00
5 ft. " " " "	5.39.	" 2.44.	" 4.66
4½ ft. " " " "			" 4.67
4 ft. " " " "	5.75.	" 2.20.	" 4.27
3 ft. " " " "	3.19.	" 1.45.	" 4.09
2½ ft. " " " "			" 3.24
2 ft. " " " "	1.66.	" 92.	" 1.72
1 ft. Pipe, " " " "	1.20.	" 70.	" 94

The following sewers being exceptional in their cost, on account of the depth of cutting and the quantity of water to be contended with, are not included in the above average :

6 ft. sewer on 22d st., from the Lake to Indiana av.,	cost per ft.	\$14.60
5 ft. " " " Indiana av. to State st.,	" "	10.73

It is proper to state that the increased cost of the sewers built during the last year, over the cost of those built in 1860, is due in some degree to the increased depth of cutting and the wet bottom in which many of the former have been built. The chief cause, however, is the enhanced prices of labor and material.

For filling over new sewers to protect the same on streets not previously raised to grade, there has been expended, for teams and labor, during the past year :

On North Market street,	- - - - -	\$1,514.49
On West Twelfth street,	- - - - -	181.25
Total,	- - - - -	<u>\$1,695.74</u>

For altering the position of 2,274 linear feet of water pipes from the lines of the sewers and their connections, there has been expended \$550.50.

## CLEANSING OF SEWERS.

The following table shows the length in feet of sewers cleansed during the year, and the cost of the same by the different methods required for the various sizes of the sewers. It will be seen that the cleansing by the use of the flushing wagon is much the cheapest, but that mode is not applicable to the larger sewers, nor to the removal of compacted sand.

## CLEANSING SEWERS AND CATCH BASINS, AND COST OF SAME.

METHODS OF CLEANSING.	South District.		West District.		North District.		Totals	R'te of
	Lin ft. clea'd.	Cost.	Lin ft. clea'd.	Cost.	Lin ft. clea'd.	Cost.	lin. ft. clea'd.	cost per 100 ft.
Flushing Sewers with Tank.....	42,600	\$676.13	12,000	\$126.77	25,300	\$502.35	79,900	\$1.63
Removing deposits from main Sewers by Scrapers and Barrows.....	50	58.95	32,300	704.53	16,500	266.63	48,850	2.11
Cleansing Sewers with Chain Machine.....	3,100	387.03	.....	.....	4,800	649.49	12,900	8.03
Cleansing Catch Basins by hand....	No. of 911	807.67	No. of 591	589.79	No. of 432	354.05	No. of 1934	Each. 90c
Totals of Cost.....		\$1,929.78		\$1,421.09		\$1,772.52		\$5,123.39

## COST OF CLEANSING FOR PREVIOUS YEARS.

1859, \$1,971.59    1860, \$5,619.48    1861, \$5,474.03    1862, \$4,793.35

More cleansing has been required during the past year than usual, on account of the necessity of thoroughly cleansing the new sewers, and also because of the soft condition of the streets in the winter of 1862-3, the usual amount of flushing with the large tank could not then be done.

## COST OF REPAIRS.

There has been expended, during the year, in the three districts, for repairs of sewers and catch basins, for altering man holes and catch basin covers to suit changes of grade of the streets, and for the renewal and repairs of covers for the same, as follows: In the South District, \$720.19; in the West District, \$619.13; in the North District, \$310.53; Total, \$1,649.85. Of this amount, \$1,220.95 is due to repairs of 208, and renewals of 78, man hole and catch basin covers. Many of these covers have been in use for seven or eight years, and extensive renewals will soon be required. It is probable that it will be found desirable, from considerations of economy as well as of safety, to replace the movable part of the man hole covers with iron, on the streets which are permanently improved, and where the traffic is heavy.



## SUBSOIL DRAINAGE.

The superior efficacy of the single ring brick sewers over the pipe sewers, for subsoil drainage, continues to manifest itself. The pipe sewers are sufficiently large for many localities, and have the advantage of being more easily flushed out than the brick sewers of large size, but they do not relieve the soil from the water with which it is saturated in the wet season, in those parts of the city where there is a bed of sand resting upon clay. In such situations brick sewers are to be preferred on that account.

## PRIVATE DRAINS.

The following table shows the number of Permits issued for connexions with the sewers for private drains during the year, and the total number of connexions up to April 1st, 1864. These drains have been inspected, and plates made of their positions in the lots, which are now being copied upon the plans in the office.

PERMITS FOR PRIVATE DRAINS ISSUED IN 1863 AND 1864.

PART OF THE CITY.	6 inch Drain.	9 inch Drain.	12 inch Drain.	Total in 1863-64.	Total previ- ously laid.	Total to Apl. 1, 1864.
South District, . . . .	204	9	4	217	.....	.....
West District, . . . . .	169	26	2	197	.....	.....
North District, . . . .	108	11	3	122	.....	.....
Totals, . . . . .	481	46	9	536	2,802	3,338

Two hundred and twenty-two private drains have been ordered to be put in by the Common Council, upon the recommendation of the Board, and of these one hundred and fifty-seven have been put in by the owners of the lots, and two have been put in by the Board, and the cost of the latter remains to be collected by special assessment on the lots drained. The remaining sixty-three drains were deferred on account of the approach of winter.

The annual soundings of the depth of water in the river and branches, show that the usual water way has been maintained, and that there has been no filling up on account of the deposits from the sewers.

Which is respectfully submitted,

WILLIAM H. CLARKE,

*Prin. Assistant City Engineer.*

## CONDITION OF THE RIVER.

With the exception of two or three weeks, during the packing season last year, the condition of the river has generally been bearable ; but the causes which render it offensive are increasing every year, and it only needs a long period of drought to make it intolerable.

With regard to the means for remedying this state of things, very little, if anything, pointing to permanent and constant relief can be added to the suggestions and recommendations which will be found on pages 54 to 61 of the last annual report, except to state that any estimates of cost made then are not applicable to the present state of things. At least fifty per cent., if not more, should be added to them.

Respectfully submitted,

E. S. CHESBROUGH,

*City Engineer.*

# FINANCIAL STATEMENT.

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Trial Balance, Ledger, Board of Public Works, March 31, 1864.

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## WATER DEPARTMENT.

	DR.	CR.
Water Works.....	\$1,195,649.61	
Water Works Income.....		\$1,125,785.38
Water Loan Bonds, 6 per cent.....		1,030,000.00
Water Loan Bonds, 7 per cent.....		103,000.00
Water Loan Interest.....	524,811.59	
Water Expenses and Repairs.....	379,062.97	
Discount on 6 per cent Water Loan Bonds.....	79,384.09	
Water Fund in hands of City Treasurer .....	6,531.72	
Water Pipes.....	12,382.82	
Water Works Stock .....	13,474.80	
Water Works Coal.....	5,619.70	
Water Works Service Cocks .....	206.16	
Duncan, Sherman & Co., (Coupon acc't).....	37,130.00	
Water Works Work Shop .....	3,822.28	
R. D. Wood & Co., (Water Pipe acc't) .....		2,209.98
Lake Tunnel .....	2,919.62	
	<u>\$2,260,995.36</u>	<u>\$2,260,995.36</u>

## WATER FUND.

STATEMENT of the Cash Receipts by the Board of Public Works from April 1, 1863, to March 31, 1864, inclusive ; and detailed statement of the cost of the various operations conducted by the Board during the same time :

### RECEIPTS.

Water Tax Collected .....	\$190,885.99	
Receipts for shutting off and letting on water,	169.25	
" for tapping pipes....	4,225.35	
" for sale of pipes, coal, materials and		
work .....	818.30	
" for laying pipes and putting in hy-		
drants on private premises.....	197.64	
Steam Engine sold .....	625.00	
Received from L. Crawford damages for non-		
fulfillment of coal contract .....	1,977.57	\$198,899.10
<hr/>		
ADD—		
Balance in hands of City Treasurer March 31, 1863...	23,235.07	
		<u>\$222,134.17</u>

### EXPENDITURES.

#### ADDITIONS TO WATER WORKS.

##### IMPROVEMENT OF GROUNDS AROUND PUMPING WORKS AND RESERVOIRS.

	CASH PAYMENT.	TRUE COST.
Trees, \$28; Pickets engine house fence, \$23.55..	\$51.55	
Lumber, nails, etc., for sidewalk .....	115.08	
Paint'g fence, \$83.32; Labor on grounds, \$111.80	195.12	
Building fence, nails, lumber, etc.....	53.98	
Hauling and filling.....	123.37	
Labor and lumber for engine house park.....	38.59	
Iron for west reservoir fence.....	541.59	
Labor, nails, etc.....	67.96	
Carpenter's work on fence.....	44.00	
Ten cords stone .....	55.00	\$1,286.24
<hr/>		
ADD—		
Work at shop on engine house fence .....	30.76	
Work at shop on west reservoir fence.....	385.87	
	<u>\$416.63</u>	\$1,702.87

##### NEW ENGINE.

D. C. Cregier's traveling expenses examining latest improv'ts,	210.48	210.48
Amounts carried forward.....	\$1,496.72	\$1,913.35

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$1,496.72	\$1,913.35

## DISTRIBUTING PIPES LAID.

Cast Iron pipes, 4, 6, and 8 inch .....	\$33,141.10	
Testing and laying pipes.....	4,709.64	
Trenching and back filling.....	8,807.76	
Lead.....	5,398.83	
Rent of testing yard.....	313.61	
Repairs of testing press.....	34.62	
Hauling pipes .....	907.41	
Caps, sleeves, and small castings.....	1,539.68	
Hydrant and stop cock boxes.....	656.98	
Dockage on 147 tons of pipe.....	36.75	
Rebuilding aprons, culverts, etc.....	102.00	
Repairs service pipes.....	18.59	
Lead pipe in Kinzie street purchased of Gal. & Chi. Railroad Co.....	502.74	
Cost of patent right for use of fire hydr'ts,	500.00	
Plumbing work at pipe yard.....	126.99	
Lumber for shed.....	98.16	
Coal.....	91.08	
Miscellaneous .....	324.08	57,310.02

## ADD—

Pipes used, previously paid for.....	\$16,213.57
New hydrants put in.....	783.26
New stop cocks put in.....	826.50
Work on press and tools at shop.....	203.60
Oil used.....	7.90
Repairs caulkers' tools at shop.....	94.89
	<u>\$18,129.72</u>

## DEDUCT—

Amount received for hydrants put in, work done, and pipes laid for private parties.....	\$145.95
Scrap iron sold.....	52.50
	<u>198.45</u>

\$17,931.2775,241.29

Total addition to cost of Water Works.....	\$58,806.74	\$77,154.64
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## WORKING EXPENSES AND REPAIRS.

## EXPENSES AT THE PUMPING WORKS.

		CASH PAYMENT.	TRUE COST.
Salary of Engineer and two assistants.....	\$3,178.37		
Foreman and laborers....	2,295.88		
Coal, 2513 $\frac{1}{2}$ $\frac{9}{10}$ $\frac{5}{10}$ tons.....	16,986.00		
Oil, 288 $\frac{1}{2}$ gallons.....	273.19		
Tallow, 843 lbs.....	91.30		
Packing, \$26.47; Gas burners \$6.25.....	32.72		
Brass rail for engine.....	226.46		
Hardware, stove and castings.....	98.32		
Carpenter work, painting and lumber.....	45.32		
Gas, \$144 83; Cotton waste, \$158.86.....	303.69		
Weighing and stowing coal.....	131.62		
Fittings for engine .....	18.79		
Hay .....	29.93		
Repairs buggy .....	13.50		
Miscellaneous.....	42.17	\$23,767.26	
ADD—			
191 $\frac{1}{2}$ $\frac{5}{10}$ $\frac{9}{10}$ tons coal previously paid for. ...	\$661.68		
Work done at shop.....	244.92		
	<u>\$906.60</u>		
DEDUCT—			
Oil used .....	53.90		
	<u>\$852.70</u>		\$24,619.96

## MISCELLANEOUS OPERATING EXPENSES.

Wages, caulkers and laborers on hydrants, stop cocks, etc.....	\$3,827.70		
Tools and hardware.....	21.60		
Carpenter work, lumber and nails .....	261.69		
Hay, feed and oats.....	505.45		
Watching reservoir and inlet .....	390.76		
Horse shoeing .....	20.52		
Harness and repairing .....	39.05		
Building catch basins for hydrants.....	1,014.33		
Repairing streets, \$156.87; Trenching, \$42..	198.87		
Sand, stone and gravel.....	95.50		
Wagon and painting.....	36.89		
Drain pipe, brick, cement and covers for catch basins.....	293.23		
Resetting telegraph cable and work at North Reservoir.....	43.31		
Miscellaneous.....	167.44	\$6,916.34	
Amounts carried forward.....		<u>\$30,683.60</u>	<u>\$24,619.96</u>



	CASH PAYMENT. TRUE COST.	
Amounts brought forward.....	\$30,683.60	\$24,619.96
ADD—		
Work done at shop on tools.....	\$3.59	
Oil used.....	10.50	
Depreciation, horses, wagons, etc.....	140.00	
	<hr/>	
	\$154.09	
DEDUCT—		
Receipts shutting off water, etc..	\$169.25	
Sand sold and work done.....	74.75	244.00
	<hr/>	<hr/>
	89.91	6,826.43
REPAIRS.		
<i>Reservoirs—</i>		
Laying bottom South Reservoir,....	\$350.00	
Brick for furnace.....	6.40	
Repairing sidewalk.....	9.00	
Glazing and hardware.....	50.50	\$415.90
	<hr/>	
<i>Hydrants and Stop Cocks—</i>		
Labor.....	\$2,232.82	
Carpenter work.....	227.41	
Hay, feed and oats.....	29.85	
Lumber.....	58.58	
Brick work \$16.50 ; Cement \$24.50	41.00	
Repairing streets.....	97.50	
Flag stone.....	8 82	
Trenching and back filling.....	13.50	
Miscellaneous ....	29.50	2,738.98
	<hr/>	<hr/>
		3,154.88
ADD—		
Work at shop on hydrants and stop cocks,	\$61.87	
Hydrants substituted....	1,233.65	
4-inch stop cocks used.....	102.33	
6-inch stop cocks used.....	132.13	
Depreciation in shop fixtures, old hydrants and stop cocks.....	320.49	
	<hr/>	
	\$1,850.47	
DEDUCT—		
Old iron sold from South Reservoir.....	27.84	
	<hr/>	
	\$1,822.63	4,977.51
Amounts carried forward.....	<hr/>	<hr/>
	\$33,838.48	\$36,423.90

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.. . . . .	\$33,838.48	\$36,423.90

## CONSTRUCTING NEW INLET.

Labor.....	\$776.62	
Carpenter work.....	129.50	
Lumber.....	568.06	
Coal.....	18.00	
Repairing pile driver.....	31.24	
Use of pile driver.....	257.33	
Use of steam pump.....	440.00	
Mason work and cement.....	90.83	
Spikes, nails and tools.....	52.35	
Miscellaneous.....	154.07	2,518.00

## DEDUCT--

Lumber used.....	\$6.20
Sand sold.....	6.00
	<u>\$12.20</u>

2,505.80

## WATER METERS.

33 meters, freight, fittings, etc.....	\$3,132.88	
Repairs.....	634.47	
Lumber.....	36 12	
Setting.....	404.80	
Plumbing.....	100.74	
Carpenter work.....	27.60	
Labor, \$116.25; Trenching, \$19.50.....	135.75	
Miscellaneous.....	37.97	4,510.33

## DEDUCT--

Valuation meters, charged stock, \$2,831.00	
Plumbing, etc., paid back.....	39.44
	<u>\$2,870.44</u>

## ADD--

Work at shop.....	\$5.10	
Depreciation on meters.....	1,029.00	1,034.10
	<u>\$1,836.34</u>	

2,673.99

## OFFICE EXPENSES AND SALARIES.

Salaries, Commissioners.....	\$2,499.96
Salary, Secretary.....	616.66
Salary, City Engineer.....	1,200.00
Salary, City Superintendent.....	475.01

Amounts carried forward.....	\$4,791.63	\$40,866.81	\$41,603.69
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		CASH PAYMENT.	TRUE COST.
Amounts brought forward .....	\$4,791.63	\$40,866.81	\$41,603.69
Salaries, Clerks.....	2,672.90		
Salaries, Water Assessor and Collectors.....	5,133.33		
Salaries, Draughtsmen.....	1,097.50		
Labor, care of office, etc.....	274.74		
Blank books, stationery, binding and printing,	876.05		
Advertising.....	229.50		
Newspapers, \$8.33; Scientific books, \$27.76,	36.09		
Office furniture and repairs.....	73.88		
Expenses horse keeping and repairs buggy,			
etc., (Assessor).....	82.30		
City maps, printing same, and tracing paper,	75.33		
Entering addition to city atlas .....	100.00		
Miscellaneous .....	127.16	15,570.41	
<hr/>			
ADD—			
Work at shop for office.....	11.91		
DEDUCT—			
Expenses refunded.....	12.25		
	<hr/>		15,570.07
	34		
Total operating expenses.....		\$56,437.22	\$57,173.76

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WORK SHOP.

Labor .....	\$1,808.42	
12 hydrants. ....	300.00	
Hydrant castings and bolts.....	2,194.10	
Brass castings .....	775.15	
Brass wire.....	96.95	
Iron, steel and hardware.....	634.83	
Coal, \$324.11; Lead, \$100.11.....	424.22	
Roofing, \$23.65; Leather, gaskets, etc., \$65.42	89.07	
Miscellaneous .....	58.72	\$6,381.46
<hr/>		
DEDUCT—		
Cash receipts for work.....	\$197.04	
Amount charged repairs.....	1,529.98	
Amount charged tunnel.....	50.84	
Amount charged engine house		
improvement.....	275.68	
Amount charged improvement for		
West Reservoir fence.....	385.87	
Amount charged meters.....	5.10	
	<hr/>	
Amounts carried forward.....	\$2,444.51	\$6,381.46

	CASH PAYMENT.	TRUE COST.
Amounts brought forward . . . .	\$2,444.51	
Am't charged distributing pipes, 1,647.27		\$6,381.46
Am't charged service cocks . . . . 17.20		
Am't charged miscellaneous . . . . 251.13	\$4,360.11	
<hr/>		
ADD—		
Oil used . . . . .	35.50	
	<hr/>	
	\$4,324.61	\$2,056.85

## INTEREST.

Interest on Water Loan Bonds, July 1, 1863, and January 1, 1864 . . . . .	\$69,010.00	
Commissions to Duncan, Sherman & Co. . . . .	171.78	\$69,181.78
<hr/>		
ADD—		
Am't transferred from Disc't to Interest . . . . .	2,851.32	72,033.10

## STOCK.

Horses purchased . . . . .	\$395.00	
One 16-horse engine purchased . . . . .	625.00	1,020 00
<hr/>		
ADD—		
Valuation meters furnished . . . . .	\$2,831.00	
DEDUCT—		
Engine sold . . . . .	\$625.00	
Old hydrants sold . . . . .	56.22	
Depreciation meters, old hydr'ts, stop cocks, etc. . . . .	1,750.47	2,431.69
	<hr/>	
	\$399.31	1,419.31

## COAL.

Coal purchased not used . . . . .	7,738.39	
DEDUCT—		
Am't refunded for coal not received . . . . .	\$2,118 69	5,619.70

## INCOME.

Rents paid back . . . . .	44.00	
Amounts carried forward . . . . .	\$84,365.63	\$81,128.96

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$84,365.63	\$81,128.96

## WATER PIPES.

Pipes purchased and not used.....	\$12,382.82	
DEDUCT—		
Amount due R. D. Wood & Co.....	2,209.98	10,172.84

## SERVICE COCKS.

Services of Tapper.....	\$610.66	
Service cocks purchased.....	1,465.93	
Cast iron boxes and iron work.....	667.91	
Permits not used refunded.....	8.30	
Services of Expressman ...	21.31	
Miscellaneous.....	177.13	2,951.24
	<u>\$2,951.24</u>	

## ADD—

Service cocks previously paid for.....	79.67	
Work at shop.....	17.20	
	<u>\$3,048.11</u>	

Cash receipts for tapping.....	\$4,225.35	
Old cocks sold.....	21.00	
Service cocks on hand Ap'l 1, 1864,	206.16	
Profit on service cock acc't.....	1,404.40	
	<u>\$4,452.51</u>	<u>\$4,452.51</u>

## LAKE TUNNEL.

Services of Tugs in taking soundings.....	\$429.00		
Labor.....	700.85		
Draughtsman.....	339.00		
Tools, blocks, etc.....	72.96		
Use of scows.....	408.00		
Advertising for proposals, printing specifications, etc.....	346.25		
Legal services.....	125.00		
Traveling expenses of engineer and others..	195.84		
Telegrams.....	56.46		
	<u>\$2,673.36</u>	<u>\$97,489.71</u>	<u>\$81,128.96</u>
Amounts carried forward.....	\$2,673.36	\$97,489.71	\$81,128.96

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$2,673.36	\$97,489.71	\$81,128.96
Rope, \$82.74; Iron & b'ksmith's work, \$39.53	122.27		
Watching scows, \$36; Use of boat, \$6.....	42.00		
Miscellaneous expenses.....	31.15	2,868.78	
<hr/>			
ADD—			
Work at shop.....	\$50.84		2,919.62
<hr/>			
		\$100,358.49	\$84,048.58
Total addition to Water Works brought forward.....		58,806.74	77,154.64
Total operating expenses brought forward....		56,437.22	57,173.76
<hr/>			
		\$215,602.45	\$218,376.98
<hr/>			
Total cash expenditures.....	\$215,602.45		
Balance of Cash in hands of City Treasurer			
April 1, 1864.....	6,531.72		
<hr/>			
	\$222,134.17		
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## SEWERAGE DEPARTMENT.

## Trial Balance, Ledger, Board of Public Works, March 31, 1864.

	DR.	CR.
Sewers North Division.....	\$238,528.30	
Sewers South Division .....	313,538.65	
Sewers West Division.....	343,302.62	
S. Lind, Treasurer Sewerage Commissioners.....	108,441.53	
Sewerage Loan Bonds, 6 per cent.....		\$87,000.00
Sewerage Loan Bonds, 7 per cent.....		975,000.00
Sewerage Loan Bonds canceled. ....		58,000.00
Sewerage Sinking Fund.....		58,732.86
Sewerage Sinking Fund Mortgages.....	16,467.10	
Discount on Sewerage Bonds.....	19,220.26	
Sewerage Loan Interest Account .....		31,728.74
House Drains.....	14,494.51	
Sewerage Pipes.....	6,038.78	
Sewerage Bricks .....	48.00	
Sewerage Stock.....	2,481.70	
American Exchange Bank .....	37,885.00	
Dennis Coughlin.....	1,561.51	
Patrick Smith.....	1,347.75	
Galena & Chicago Union Railroad Co.....		382.55
Sewerage Fund in hands of City Treasurer.....	79,145.52	
Sewerage Sinking Fund with City Treasurer.....	15,957.55	
South half Lot 5, Block 123, S. S. Addition.....	6.68	
Lot 5, Block 1, Johnston, Roberts & Storrs' Addit'n,	26.69	
Pittsburgh, Ft. Wayne & Chicago Railroad Co.....		616.84
Z. Cobb, Agt., 80 ft. west half Lot 7, Block 36, O.T.	21.53	
Chicago, Burlington & Quincy Railroad Co.....		6,744.01
Charles H. Cook.....		69.00
Sewerage man hole and catch basin covers.....	527.91	
Sewerage expenses and repairs .....	18,713.15	
East quarter Lot 2, Block 31, O. T.....	396.07	
Owners Lots 1, 2, 7, 8, Block 5, J., R. & Storrs' Ad.	44.69	
East half Lot 3, Block 4, Kinzie's Addition .....	68.50	
	<u>\$1,218,274.00</u>	<u>\$1,218,274.00</u>

## SEWERAGE FUND.

STATEMENT of the Cash Receipts by the Board of Public Works, from April 1, 1863, to March 31, 1864, inclusive; and detailed statement of the cost of the various operations conducted by the Board during the same time :

## RECEIPTS.

Proceeds 120 seven per cent. bonds sold, including premium and interest.....	\$134,965.58	
Rec'd from City account of Sewerage Tax, 1862 .....	21,942.11	
Rec'd from City account of Sewerage Tax, 1863 .....	100,887.33	
House drain permits issued.....	2,694.22	
Materials sold and work done for private parties.....	2,933.77	
Interest on collateral of E. I. Tinkham & Co.....	255.00	
	<u>\$263,678.01</u>	
ADD—		
Balance in hands of City Treasurer, April, 1863....	\$7,624.43	
		<u>\$351,302.44</u>

## EXPENDITURES.

## SEWERS—SOUTH DIVISION.

	CASH PAYMENT.	TRUE COST.
Labor .....	\$978.92	
Services of Engineer.....	189.15	
Cement .....	105.38	
Lumber, \$99.78 ; Tools and repair'g, \$48.62..	148.40	
Repaving, \$18.79 ; Repair'g gas pipes, \$30.60	49.39	
Repairing water pipes.....	6.52	
Miscellaneous.....	37.22	\$1,514.98
	<u></u>	
ADD—		
Materials for drain in Ft. D. Add.	\$29.90	
Expense Sewer on Michigan Av.,	14,114.14	
“ “ Indiana Av....	5,136.01	
“ “ North St. pipe sewer .....	598.88	
	<u></u>	
Amounts carried forward...	\$19,878.93	\$1,514.98

	CASH PAYMENT.	TRUE COST.
Amounts brought forward...	\$19,878.93	
Expense Sewer on Ringgold Pl.	35,144.82	
"    "    Wabash Av.	472.68	
Covers used previously paid for.	113.25	
Brick used previously paid for.	45.05	
Pipes used previously paid for.	100.40	\$55,755.13
DEDUCT—		
Receipts for work done..	127.03	
	<u>\$55,628.10</u>	\$57,143.08
SEWERS—WEST DIVISION.		
Labor, \$3,840.74; Cement, \$549.33 .....	\$4,390.07	
Services of Engineer.....	324.16	
Labor altering water pipes.....	467.64	
Laying pipe sewers.....	311.66	
Lumber, \$102.62; Repair'g gas pipes, \$34.50,	137.12	
Brick, \$48; Tools and repairing, \$48.65....	96.65	
Miscellaneous.....	32.93	5,760.23
ADD—		
Expense Sewer North St.....	\$2,180.45	
"    "    North St.....	1,323.89	
"    "    Adams St. ....	6,501.47	
"    "    Fulton St .....	4,195.58	
"    "    Harrison St ...	16,309.02	
"    "    Twelfth St.....	26,592.08	
"    "    Reuben St.....	1,690.99	
"    "    Maxwell St.....	8,476.06	
"    "    Sheldon St.....	1,041.52	
"    "    Canal St.....	3,164.23	
"    "    Rucker St.....	660.50	
"    "    Peck St.....	628.94	
"    "    Aberdeen St...	204.09	
"    "    Sangamon St...	54.00	
Pipes used previously paid for..	1,277.00	
Brick used previously paid for..	101.06	
Man hole and catch basin covers		
previously paid for .....	648.75	75,049.63
DEDUCT—		
Receipts for work done.....	\$65.99	
Slants charged in error ...	24.37	
Am't p'd by C., B. & Q. RR. Co.	913.43	1,003.79
	<u>\$74,045.84</u>	79,806.07
Amounts carried forward.....	\$7,275.21	\$136,949.15

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$7,275.21	\$136,949.15

## SEWERS—NORTH DIVISION.

Labor.....	\$1,911.22	
Cement .....	265.94	
Tools and repairing.....	48.61	
Services of Engineer .....	299.04	
Lumber .....	102.62	
Miscellaneous.....	23.10	
Repairing water pipes.....	6.51	2,657.04

## ADD—

Expense Sewer Green Bay St..	\$48.60
“ “ N. Market St..	16,037.26
“ “ Hinsdale St....	316.93
“ “ Chicago Av....	3,443.26
“ “ Division St....	3,706.99
“ “ Wolcott St....	1,411.60
“ “ Elm St.....	794.98
“ “ Huron St .....	194.73
“ “ Superior St....	199.29
“ “ Pearson St....	636.43
“ “ White and Wol-	
cott Sts.....	1,199.37
Bricks used previously paid for..	81.46
Pipes used previously paid for...	1,134.70
Covers used previously paid for..	487.50

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\$29,693.10

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32,350.14

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69,299.29

## SEWERAGE INTEREST.

Interest on Sewerage Loan Bonds, July 1, 1863, and January 1, 1864.....	\$69,270.00	
Commissions to American Exch. Bank ...	173.18	69,443.18

## DEDUCT—

Accrued interest on 120 Bonds sold.....	\$1,765.58
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## ADD—

Accrued interest on 20 Bonds purchased.....	287.78
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\$1,477.80

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67,965.38

Amounts carried forward...	\$79,375.43	\$237,264.67
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	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$79,375.43	\$237,264.67

## CLEANSING SEWERS—SOUTH DIVISION.

Labor.....	\$1,751.28		
Tools and repairs.....	21.98		
Lumber, \$1.87; Rope, \$7.67.....	9.54		
Water for flushing.....	150.40		
Miscellaneous.....	9.58	1,942.78	1,942.78

## CLEANSING SEWERS—WEST DIVISION.

Labor.....	\$1,266.75		
Tools and repairs.....	18.13		
Lumber, \$1.87; Rope, \$7.68.....	9.55		
Water for flushing.....	30.08		
Miscellaneous.....	9.59	1,334.10	1,334.10

## CLEANSING SEWERS—NORTH DIVISION.

Labor.....	\$1,676.07		
Tools and repairs.....	18.11		
Lumber.....	1.87		
Water for flushing.....	75.20		
Rope, \$7.68; Miscellaneous, \$9.59.....	17.27	1,788.52	1,788.52

## REPAIRS OF SEWERS—SOUTH DIVISION.

Labor.....	\$400.17		
Cement.....	26.54		
Tools.....	7.01		
Miscellaneous.....	5.00	438.72	
ADD—			
Cement used previously paid for, \$14.15			
Covers used previously paid for. 306.00			
Depreciation of Tools, etc.....	104.64	\$424.79	
DEDUCT—			
Receipts for work done.....	17.13		
	\$407.66		846.38
Amounts carried forward.....		\$84,879.55	\$243,176.45



	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$84,879.55	\$243,176.45

## REPAIRS OF SEWERS—WEST DIVISION.

Labor.....	\$391.38	
Cement.....	59.09	
Tools and repairs.....	7.00	457.47
<hr/>		
ADD—		
Cement used previously paid for, \$14.14		
Covers used previously paid for.. 179.75		
Depreciation in tools..... 104.64	298.53	756 00
	<hr/>	

## REPAIRS OF SEWERS—NORTH DIVISION.

Labor.....	\$279.45	
Cement ... ..	15.50	
Tools and repairs .....	7.00	301.95
<hr/>		
ADD—		
Cement used previously paid for... \$14.14		
Covers used previously paid for.... 35.00		
Depreciation tools, etc..... 104.64		
	<hr/>	
	\$153.78	455.73

## HOUSE DRAINS.

Services of Engineer.....	\$1,450.00	
Horse keeping for Engineer.....	260.38	
Labor.....	197.86	
Permit refunded.....	5.00	
Inspector.....	63.00	1,976.24
<hr/>		
DEDUCT—		
Cash receipts for permits.... \$2,694.22		
Permits ch'g'd owners of sun-		
dry lots..... 20.00		
Permits charged sewers West		
Division..... 64.00	\$2,778.22	
	<hr/>	
ADD—		
Pipe junctions used....	2,051.62	
	<hr/>	
	\$726.60	1,249.64
<hr/>		
Amounts carried forward.....	\$87,615 21	\$245,637.82

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$87,615.21	\$245,637.82

MAN HOLE AND CATCH BASIN COVERS.

Labor.....	\$808.61	
Oak lumber and freight.....	1,352.38	
Spikes and nails.....	205.24	
Tar, \$52.50; Sand, \$6.00.....	58.50	2,424.73
<hr/>		
DEDUCT—		
Covers sold... ..	\$70.00	
Covers used for sewers & rep's,	2,574.25	
Freight lumber refunded ....	11.25	\$2,655.50
<hr/>		
ADD—		
Covers on hand previously paid for....	758.68	
	<hr/>	
	\$1,896.82	527.91

OFFICE EXPENSES AND SALARIES.

Salaries—Commissioners .....	\$2,499.96	
Secretary.....	600.00	
Engineer ... ..	1,200.00	
Ass't Superintendent .....	466.68	
Clerks.....	2,570.84	
Blank books and stationery .....	184.83	
Advertising (including proposals for bonds)	500.36	
Lithographing bonds.....	250.00	
Lithographing maps.....	25.00	
Entering additions on City Atlas .....	100.00	
Printing, including report of April 1, 1863,	156.57	
Revenue stamps .....	66.67	
Maps, \$28.33; Scientific books, \$26.25...	54.58	
Office furniture.....	103.81	
Office fixtures and repairs.....	40.00	
Draughtsman.....	10.00	
Miscellaneous ... ..	101.18	8,930.48
<hr/>		
DEDUCT—		
Expense charged in error .....	\$4.00	
ADD—		
Expense charges transferred....	2.50	
	<hr/>	
	\$1.50	8,928.98
<hr/>		
Amounts carried forward.....	\$98,970.42	\$255,094.71

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$98,970.42	\$255,094.71

## SEWERAGE PIPES.

Pipes purchased.....	\$3,828.39	
Labor and Miscellaneous....	93.22	
Advertising proposals.....	11.00	3,932.61
	<hr/>	

## SEWERAGE STOCK.

Oak sheeting and tools purchased.....	\$268.47	
302 feet hose purchased .....	424.02	
Lumber.....	28.65	721.14
	<hr/>	

## SEWERAGE BRICKS.

Bricks purchased and labor .....	\$325.77	325.77
	<hr/>	

## CEMENT ACCOUNT.

Cement purchased.....	\$414.84	414.84
	<hr/>	

## NORTH STREET SEWER. 795 FEET. 3 FEET SEWER.

Langan and McHugh, on contract.....	\$766.70	
Labor, \$16.50 ; Services Engineer, \$7.69,	24.19	790.89
	<hr/>	
Add—		
Covers used.....	5.00	
Bricks furnished by C. B. & Q. R.R. Co.	528.00	
	<hr/>	
	\$533.00	1,323.89

## FULTON STREET SEWER. 674 FEET. 4½ FEET SEWER.

J. B. Benedict, on contract.....	\$2,595.46	
Bricks... ..	1,127.43	
Services Engineer.....	42.03	
Labor.....	151.78	
Cement.....	256.08	4,172.78
	<hr/>	
Add—		
Covers used.....	12.00	
Pipes used.....	10.80	
	<hr/>	
	\$22.80	4,195.58
Amounts carried forward....	\$109,328.45	\$260,614.18

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$109,328.45	\$260,614.18

## ADAMS STREET SEWER. 1418 FEET. 4½ FEET SEWER.

John Duffy, on contract.....	\$4,392.44	
Bricks .....	1,052.98	
Cement .....	482.54	
Services Engineer .....	138.13	
Repairing gas main .....	50.00	
Labor.....	266.78	
Repairing gas pipes.....	59.80	6,442.67

## Add—

Covers used.....	\$20.00	
Pipes used.....	28.80	
	<u>\$58.80</u>	

6,501.47

## RINGOLD PL. SEWER. 852 FT. 6 FT. 1286 FT. 5 FT. 877 FT. 3 FT.

J. B. Benedict, for mason work, labor, etc., constructing 6, 5, and 3 feet sewer.....	\$25,222.44	
Engineers and Inspectors.....	272.86	
Bricks .....	5,385.90	
Cement.....	1,844.84	
Portable engine.....	625.00	
Fittings for the same.....	147.52	
Changing location of gas pipes. ....	25.95	
Re-Macadamizing street.....	722.40	
Rebuilding aprons, culverts, crossings, etc.,	189.00	
Cartage on engine and pumps.....	14.50	
Lengthening water pipes....	20.46	
Labor ...	556.95	35,027.82

## Add—

Covers used.....	\$60.00	
Pipes used.....	63.00	123.00

## Deduct—

Sand sold.....	6.00	
	<u>\$117.00</u>	

35,144.82

## HARRISON STREET SEWER. 3016 FEET. 5 FEET SEWER.

John Duffy, on contract... ..	\$8,715.35
Bricks.....	5,715.09
Cement ....	1,168.02

Amounts carried forward.....	\$15,598.46	\$150,798.94	\$302,260.47
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		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$15,598.46	\$150,798.94	\$302,260.47
Engineer and Inspector.....	103.64		
Labor.....	447.34		
Lumber and nails, replacing sidewalk.....	21.09		
Lengthening water pipe .....	6.49		
Repairing gas pipes .....	24.00	16,201.02	
And—			
Covers used.....	\$54.00		
Pipes used.....	54.00		
	<u>\$108.00</u>		16,309.02

## NORTH MARKET ST. SEWER. 3526 FEET. 5 FEET SEWER.

Tho. Mackin, on contract.....	\$5,731.43		
Bricks.....	6,060.68		
Cement .....	1,897.27		
Labor.....	1,814.52		
Engineer and Inspector.....	33.16		
Lowering water main.....	193.50		
Teams, hauling....	24.50		
Lengthening service pipe .....	57.30		
Sand .....	12.50	15,824.86	
And—			
Covers used.....	\$90.00		
Pipes used....	122.40		
	<u>\$212.40</u>		16,037.26

## TWELFTH STREET SEWER. 3379 FEET 5 FT. 2670 FEET 4½ FT.

William Woodruff, on contract.....	\$11,866.04		
Bricks.....	10,805.20		
Cement .....	2,699.31		
Labor.....	602.70		
Engineer and Inspectors.....	198.09		
Filling street.....	181.25		
Replacing sidewalks.....	21.09	26,373.68	
And—			
Covers used.....	\$96.00		
Pipes used.....	122 40		
	<u>\$218.40</u>		26,592.08
Amounts carried forward.....		<u>\$209,198.50</u>	<u>\$361,198.83</u>



	CASH PAYMENT.		TRUE COST.
Amounts brought forward .....	\$209,198.50		\$361,198.83
HINSDALE STREET SEWER. 406 FEET. 2 FEET SEWER.			
Thomas Mackin, on contract.....	\$231.80		
Labor.....	54.06		
Lengthening service pipe.....	16.37	302.23	
Add—			
Covers used .....	\$7.50		
Pipes used.....	7.20		
	<u>\$14.70</u>		316.93
CHICAGO AVENUE SEWER. 1188 FEET 2 FT. 1728 FEET 2½ FT.			
Thomas Mackin, on contract.....	\$1,662.85		
Bricks .....	1,243.91		
Cement.....	108.29		
Engineer and Inspectors.....	122.82		
Labor....	173.12		
Plumbing work.....	21.32		
Lengthening service pipe....	4.85	2,337.16	
Add—			
Covers used.....	\$82.50		
Pipes used.....	23.60		
	<u>\$106.10</u>		3,443.26
REUBEN STREET SEWER. 400 FEET. 4 FEET SEWER.			
William Woodruff, on contract.....	\$969.68		
Bricks.....	452.40		
Cement .....	133.45		
Labor.....	30.09		
Engineer and Inspectors .....	92.62	1,678.24	
Add—			
Covers used.....	\$3.75		
Pipes used.....	9.00		
	<u>\$12.75</u>		1,690.99
DIVISION STREET SEWER. 220 FEET 5 FT. 331 FEET 3 FT.			
Langan and McHugh, on contract.....	\$582.28		
Bricks....	1,618.44		
Thomas Mackin, on contract.....	721.02		
Amounts carried forward.....	\$2,951.74	\$214,516.13	\$366,650.01

		CASH PAYMENT.	TRUE COST.
Amounts brought forward .....	\$2,951.74	\$214,516.13	\$366,650.01
Cement .....	403.73		
Engineer and Inspectors.....	125.92		
Labor.....	152.53		
Lengthening service pipe.....	10.22	3,644.14	
ADD—			
Covers used.....	\$32.25		
Pipes used.....	30.60		
	<u>\$62.85</u>		\$,706.99

## MAXWELL STREET SEWER. 1977 FEET. 5 FEET SEWER.

Wallace Carter, on contract.....	\$3,594.95		
Bricks .....	3,622.80		
Cement .....	902.73		
Labor.....	257.86		
Engineer and Inspector.....	26.92	8,405.26	
ADD—			
Covers used .....	\$42.00		
Pipes used.....	28.80		
	<u>\$70.80</u>		8,476.06

## MICHIGAN AV. SEWER. 1266 FEET 3 FT. 1405 FEET 2½ FT.

Labor.....	\$9,906.45		
Bricks .....	2,673.07		
Cement .....	1,127.21		
Engineer and Inspectors.....	241.03		
Timber and pine lumber .....	63.00	14,010.79	
ADD—			
Covers used.....	\$63.75		
Pipes used.....	39.60		
	<u>\$103.35</u>		14,114.14

## INDIANA AVENUE SEWER. 1405 FEET. 2½ FEET SEWER.

Thomas Mackin, on contract....	\$2,545.27		
Bricks .....	1,460.80		
Cement .....	746.61		
Engineer and Inspectors.....	226.53		
Labor.....	101.15	5,080.36	
Amounts carried forward.....		<u>\$245,656.68</u>	<u>\$392,947.20</u>

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$245,656.68	\$392,947.20
Add—		
Covers used.....	\$41.25	
Pipes used.....	14.40	
	<u>\$55.65</u>	5,136.01

## NORTH STREET PIPE SEWER.

William Woodruff, on contract.....	\$361.00	
Labor.....	19.77	
Services of Engineer.....	7.69	
Lumber.....	27.97	416.43
	<u></u>	
Add—		
Covers used.....	\$11.25	
Pipes used.....	155.20	
Bricks used.....	16.00	
	<u>\$182.45</u>	598.88

## WOLCOTT STREET SEWER. 556 FEET 2½ FT. 314 FEET 2 FT.

Langan & McHugh, on contract... ..	\$828.53	
Bricks.....	424.00	
Labor.....	55.37	
Inspectors.....	50.60	1,358.50
	<u></u>	
Add—		
Covers used.....	\$22.50	
Pipes used.....	30.60	
	<u>\$53.10</u>	1,411.60

## ELM STREET SEWER. 369 FEET. 2 FEET SEWER.

Langan & McHugh, on contract.....	\$548.88	
Bricks.....	166.20	
Labor and Inspecting.....	56.05	771.13
	<u></u>	
Add—		
Covers used.....	\$11.25	
Pipes used.....	12.60	
	<u>\$23.85</u>	794.98
Amounts carried forward .....	<u>\$248,202.74</u>	<u>\$400,888.67</u>

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$248,202.74	\$100,888.67
SHELDON STREET SEWER. 448 FEET. 2 FEET SEWER.		
Wallace Carter, on contract.....	\$747.30	
Bricks .....	208.00	
Cement .....	13.28	
Inspecting and labor .....	47.14	1,015.72
Add—		
Covers used.....	\$15.00	
Pipes used.....	10.80	
	<u>\$25.80</u>	1,041.52
CANAL STREET SEWER. 1773 FEET 2 FT. 664 FEET 1 FT.		
Wallace Carter, on contract.....	\$1,809.79	
Bricks .....	480.00	
Cement .....	210.27	
Services Engineer and Inspector .....	119.00	
Labor.....	67.43	
Lengthening water pipes.....	13.14	2,669.63
Add—		
Covers used.....	\$75.00	
Pipes used.....	389.60	
	<u>\$464.60</u>	3,164.23
RUCKER STREET SEWER. 486 FEET. 2 FEET SEWER.		
Wallace Carter, on contract.....	\$304.67	
Bricks .....	192.00	
Inspectors and Rodmen .....	54.63	
Cement .....	63.95	
Services of Engineer... ..	25.00	640.23
Add—		
Covers used .....	\$11.25	
Pipes used.....	9.00	
	<u>\$20.25</u>	660.50
PECK STREET SEWER. 440 FEET. 2 FEET SEWER.		
Wallace Carter, on contract.....	\$297.66	
Bricks .....	208.00	
Amounts carried forward.....	<u>\$505.66</u>	<u>\$252,558.34</u>
		<u>\$405,751.92</u>

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$505.66	\$252,558.34	\$405,754.92
Cement .....	55.19		
Labor and inspecting.....	44.09	604.94	
Add—			
Covers used .....	\$15.00		
Pipes used.....	9.00		
	<u>\$24.00</u>		628.94
ABERDEEN STREET SEWER.			
Bricks .....	\$192.00		
Labor.....	12.09	204.09	204.09
	<u>          </u>		
HURON STREET SEWER.			
Bricks .....	\$175.64		
Labor.....	19.09	194.73	194.73
	<u>          </u>		
SUPERIOR STREET SEWER.			
Bricks .....	\$187.20		
Labor.....	12.09	199.29	199.29
	<u>          </u>		
PEARSON STREET SEWER. 253 FEET. 2 FEET SEWER.			
Langan & McHugh, on contract.....	\$348.39		
Bricks .....	227.60		
Labor.....	19.59		
Inspector's services.....	20.75	616.33	
	<u>          </u>		
Add—			
Covers used .....	\$7.50		
Pipes used.....	12.60		
	<u>\$20.10</u>		636.43
WHITE AND WOLCOTT ST. SEWER. 438 FEET. 2 FEET SEWER.			
Langan & McHugh, on contract.....	\$1,036.89		
Bricks .....	80.00		
Labor and inspecting.....	60.43	1,177.32	
	<u>          </u>		
Add—			
Covers us'd \$11.25 ; Pipes \$10.80, \$22.05			1,199.37
	<u>          </u>		
Amounts carried forward.....		<u>\$255,555.04</u>	<u>\$408,817.77</u>



	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$255,555.04	\$408,817.77
WABASH AVENUE SEWER.		
Bricks .....	\$436.68	
Labor.....	21.00	
Services of Engineer.....	15.00	472.68
		472.68
SANGAMON STREET SEWER.		
Labor .....	\$42.00	
Services of Engineer.....	12.00	54.00
		54.00
GREEN BAY STREET SEWER.		
Carlin & McCabe, balance on contract....	48.60	48.60
MISCELLANEOUS.		
Amount paid to Sinking Fund for its proportion of sewerage tax 1862, collected.....	\$15,534.60	
Private drain constructed, lot 18, block 5, Webster, Wright & Webster's Addition.....	18.25	
Private drain east half lot 3, block 4, Kinzie's Add...	33.00	
Private drain lots 1, 2, 7, and 8, block 5, Johnston, Roberts & Storr's Addition.....	44.69	
Amount of tax 1861, erroneously credited. ....	396.06	
	\$272,156.92	
Balance in hands of City Treasurer April 1, 1864....	79,145.52	
	<u>\$351,302.44</u>	

## SEWERAGE SINKING FUND.

## RECEIPTS.

Proportion of sewerage tax 1862.....	\$15,534.60	
Interest on Sinking Fund Mortgage, H. Joy.....	295.56	
Interest (and part principal) Sinking Fund Mortgage, H. Joy.....	1,500.00	
Balance of principal Sinking Fund Mortgage, Timothy Wright.....	9,250.00	
Interest on same to 2d of March, 1864.....	1,605.69	
	<u>\$28,185.85</u>	
Balance in hands of City Treasurer April 1, 1863....	10,430.60	\$38,616.45

## EXPENDITURES.

City tax of 1862 on east $\frac{1}{4}$ lot 2, block 31, O. T., prop- erty embraced in Sinking Fund Mortgage, W. Hil- debrand .....	\$110.56	
County Tax of 1862 on same.....	58.06	
Twenty Bonds purchased and canceled, Nos. 1101 to 1120 inclusive, 7 per cent.....	20,000.00	
Premium and accrued interest on same.....	2,487.78	
Notarial fees in releasing mortgage, Timothy Wright..	2.50	
	<u>\$22,658.90</u>	
Balance in hands of City Treasurer April 1, 1864....	15,957.55	\$38,616.45

## CITY DEPARTMENT.

## Trial Balance, Ledger, Board of Public Works, March 31, 1864.

City Appropriation Fund.....	\$35,088.78	
North Division.....		\$3,621.86
South Division.....		4,584.99
West Division.....		6,557.38
Public Buildings.....		2,042.40
Paving in front of Post Office.....		814.66
Bridge Department.....		17.12
Chicago Cemetery.....		577.09
Lumber Account.....	144.32	
Rush Street Bridge.....	10,175.46	
City Expense Acc't office.....		251.78
Chicago Harbor.....		3,819.35
Public Parks....		511.18
Stone Account.....	120.00	
Intersections of Streets.....		20,204.80
Dredging Bar at mouth of Harbor.....	19,659.34	
Widening and deepening South Branch, near Van Buren Street bridge..	8,000.00	
Special Appropriation.....		27,659.34
City Proportional Expense Account.....		2,224.70
Street Lamps, West Division.....		301.25
Special Assessments.....	247,664.54	
South Water Street Improvement.....		80.92
Kinzie and North Water Street Improvement.....		370.29
Sidewalk Improvements.....	363.15	
West Lake Street Improvement .....		32,167.03
Canal Street Improvement .....		32.00
Alley, Block 46, Kinzie's Add.....		130.00
Opening Alley, Lot 5, Block 64, C. T. Sub., 7, 39, 14..		139.95
North Clark Street Improvement (grading).....		965.80
North Clark Street Improvement (straightening).....		860.00
Wells Street Improvement.....		32,882.14
Wabash Avenue Improvement....		98,166.34
Canal Street Improvement.....		846.99
Amounts carried forward.....	\$321,215.59	\$339,778.86

Amounts brought forward.....	\$321,215 59	\$339,778.86
Clark Street Improvement (Nicholson pavement).....		15,805.53
Lumber Street Improvement.....		2,800.68
Milwaukee Avenue Improvement.....		5,782 96
Benton Place Improvement.....		1,132.82
Alley, Block 7, Ft. Dearborn Add.....		22.16
Alley, Block 46, O. T.....		317.10
Holt Street Improvement.....		520.00
Walnut Street Improvement.....		490.37
Alley, Block 45, Sec. 7, 39, 14.....		334.55
Fourteenth Street Improvement.....		20,466.97
Dredging South Branch at Quarry Street....		19,479.00
Dredging South Branch near Bridgeport.....		3,710.00
Eighteenth Street Improvement.....		3,520.00
Sidewalk Improvement, Block 2, Sec. 17, 39, 14.....		43.20
Dearborn Street Improvement....		100.00
Sundry Lamp Post Assessments.....		4,050.72
South Water Street Improvement No. 2.....		2,860.67
	<u>\$321,215.59</u>	<u>\$321,215.59</u>

## BOARD OF PUBLIC WORKS APPROPRIATION FUND.

STATEMENT of the Cash Receipts by the Board of Public Works, from April 1, 1863, to March 31, 1864, inclusive, and detailed statement of the cost of the various operations conducted by the Board during the same time :

## RECEIPTS.

Amount appropriated by Common Council....	\$92,884.18	
Street taxes collected .....	516.50	
Permits issued, etc.....	738.30	
Digging graves in Cemetery and sand sold .....	2,084.00	
Rent of lots, account Cemetery Fund .....	50.00	
Lumber sold.....	52.68	
Hay sold .....	42.50	
Damages to bridges and materials sold.....	240.15	
Old iron sold from Rush street bridge.....	3,119.33	
Received from building aprons, culverts, etc., So. Div.	291.00	
Received from Chicago, Bur. & Quincy R.R. Co., acc't Canal street improvement.....	1,239.69	
Amounts erroneously charged, refunded .....	301.05	
Received from town of South Chicago.....	853.88	
Received from Chicago City Railway Co., paving Clark and Madison streets.....	282.20	
Amount refunded by owners for filling intersections of streets, South Wells street improvement.....	3,031.37	
Repaving streets and repairing sidewalks.....	1,473.08	
Replanking North Clark street from river to new North Water street.....	471.00	
	<hr/>	
	\$107,670.91	
Balance in hands of City Treasurer April 1, 1863....	30,791.96	\$138,462.87
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**EXPENDITURES.****SOUTH DIVISION.**

		CASH PAYMENT.	TRUE COST.
Labor on streets and sidewalks.....	\$11,624.92		
Lumber.....	1,550.16		
Stone .....	952.63		
Gravel ... ..	220.00		
Nails and spikes.....	288.53		
Engineer and Rodmen.....	143.30		
Distributing sidewalk notices.....	645.33		
Repairing paving.....	99.13		
Six barrels composition.....	62.00		
One-third cost iron roller.....	66.66		
Tools and repairs.....	59.70		
Inspector.....	60.00		
Lettering street signs .....	77.90		
Miscellaneous .....	45.15	\$15,905.41	

**ADD—**

Lumber used previously paid for..... \$322.08

**DEDUCT—**

Permits issued :..... \$249.26

Sidewalks constructed and pav'g, 296.83

Rebuilding aprons, culverts, etc.. 291.00 837.09

\$515.01

\$15,390.40

**WEST DIVISION.**

Labor on streets and sidewalks.....	\$14,100.01		
Lumber.....	2,875.95		
Stone .....	1,039.74		
Nails and Spikes.....	585.33		
Services of Engineer and Rodman.....	143.38		
Distributing sidewalk notices.....	1,347.33		
Street taxes refunded.....	1.50		
Tools and repairs.....	103.28		
One-third cost Iron roller .....	66.67		
Repairing sidewalks.....	14.68		
Repairing culverts and crossings.....	22.81		
Miscellaneous .....	34.72	20,335.40	

**ADD—**

Lumber used previously paid for. .... \$334.53

Amounts carried forward,..... \$334.53 \$30,240.81 \$15,390.40



	CASH PAYMENT.		TRUE COST.
Amounts brought forward .....	\$334.53	\$36,240.81	\$15,390.40
DEDUCT—			
Permits issued .....	\$248.27		
Sidewalks constructed.....	527.61	775.88	
		<u>\$441.35</u>	19,894.05

## NORTH DIVISION.

Labor on streets and sidewalks.....	\$12,661.09		
Lumber .....	1,425.50		
Stone .....	673.33		
Nails and spikes.....	372.00		
Services Engineer, Rodman, and Inspector..	200.32		
Distributing sidewalk notices.....	643.33		
Tools and repairs .....	47.26		
One-third cost iron roller.....	66.67		
Street taxes refunded .....	3.00		
Blacksmith's work.....	10.50		
Miscellaneous.....	44.82	16,147.82	
ADD—			
Lumber used previously paid for..	\$317.91		
Gravel used.....	42.67	\$360.58	
DEDUCT—			
Permits issued .....	\$240.77		
Sidewalks constructed.....	682.83		
Replanking North Clark street f'm river to new North Water st ..	471.00	1,394.60	
		<u>\$1,034.02</u>	15,113.80

## CHICAGO CEMETERY.

Labor and teams.....	\$2,255.61		
Salary Superintendent.....	233.31		
Lumber and nails.....	182.37		
Hardware and tools.....	27.00		
Hose pipe, sprinkler, etc.....	26.25		
Plumbing work.....	14.61		
Coal .....	11.80	2,750.95	
DEDUCT—			
Rec'ts dig. graves, sand sold, etc.	\$2,084.00		
Rents of lots.....	50.00		
Gravel charged North Division..	38.50		
	<u>\$2,172.50</u>		578.45
Amounts carried forward.....		<u>\$55,139.58</u>	<u>\$50,976.70</u>

	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$55,139.58	\$50,976.70

## LUMBER ACCOUNT.

Lumber purchased not used.....	150.32	
DEDUCT—		
Lumber sold.....	<u>\$6.00</u>	144.32

## PUBLIC BUILDINGS.

## ENGINE HOUSES.

Carpenters' work.....	\$740.42		
Lumber .....	98.44		
Plumbing and gas fitting.....	181.12		
Roofing and repairs.....	227.51		
Rent of lot engine house No. 15 .....	15.00		
Repairs engine house No. 15. ....	10.81		
Blacksmith's work.....	12.80		
Plastering.....	105.37		
Building fence engine No. 8.....	57.12		
Painting and glazing.....	88.72		
Zinc for mangers, copper, etc.....	59.35		
Laying platform.....	22.00		
Hardware .....	23.38		
Miscellaneous .....	<u>21.26</u>	1,663.30	1,663.30

## ISLAND QUEEN ENGINE HOUSE.

Tho. E. Courtney on contract for building ..	\$1,747.12		
Iron work, \$22.09; Lead pipe, 25.75.....	47.84		
Lumber .....	<u>9.24</u>	1,804.20	
ADD—			
Iron used from Rush street bridge.....	\$21.28		1,825.48

## COURT HOUSE.

Carpenter work .....	\$10.50		
Repairing plaster.....	16.25		
Carpenter work Comptroller's and Treasurer's office .....	473.40		
Painting, glazing, etc., do., do.....	198.58		
Painting and glazing.....	<u>59.53</u>		
Amounts carried forward....	\$758.26	\$58,757.40	\$54,609.80

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$758.26	\$58,757.40	\$54,609.80
Hydrant and fixtures.....	49.27		
Patent spring hinges.....	63.00		
Miscellaneous.....	21.83	892.36	892.36

## NORTH MARKET.

Carpenter work.....	\$3.50		
Plumbing.....	1.13		
Painting and glazing.....	14.80		
Locks, etc.....	3.37		
Repairing pipe.....	5.25	28.05	28.05

## BRIDEWELL.

Carpenter work.....	\$13.00		
Painting and glazing.....	11.78		
Nails.....	9.00	33.78	33.78

## ARMORY.

Fitting up Police Court room.....	\$275.50		
Plastering Police Court room.....	10.00		
Repairing roof.....	2.05		
Plumbing.....	28.50		
Carpenter work.....	3.00		
Repairing Police Court room.....	24.74	343.79	343.79

## WEST MARKET.

Gas fitting.....	\$3.38		
Carpenter work.....	3.00	6.38	6.38

## BRIDGE DEPARTMENT.

Carpenter work.....	\$551.00		
Spikes and nails.....	436.37		
Lumber.....	417.43		
Tools and hardware.....	41.41		
Hauling coal.....	29.35		
Labor, \$26.68; Rope, \$51.07.....	77.75		
Oil.....	166.52		
Gas and kerosene lamps.....	82.00		
Amounts carried forward...	\$1,801.83	\$60,061.76	\$55,914.16

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$1,801.83	\$60,061.76	\$55,914.16
Blacksmith's work.....	152.52		
Making patterns.....	80.70		
Painting and materials .....	74.20		
Screws, \$21 ; Iron, etc., \$1.04... ..	22.04		
Hay, oats, and feed.....	115.51		
Miscellaneous.....	10.25	2,257.05	
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DEDUCT—			
Amount erroneously charged....	\$68.00		
Damage to bridges.....	206.00		
Old iron and rope sold .....	34.15	\$308.15	
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ADD—			
Hay used... ..	\$15.00		
Iron from Rush street bridge....	7.74	22.74	
		<hr/>	
	\$285.41		1,971.64

## NORTH AVENUE BRIDGE.

Salary of Tender, April and May, 1863 .....	\$60.00		
Carpenter work.....	22.25		
Stove pipe, etc.....	3.76		
Lumber, \$11.50 ; Blacksmith's work, \$1.64..	13.14		
Coal .....	10.35	109.50	109.50
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## CLYBOURNE AVENUE BRIDGE.

Salary of Tender.....	\$40.00		
Carpenter work and hardware.....	10.25		
Stove pipe, etc.....	8.80		
Coal.....	5.00	64.05	64.05
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## CHICAGO AVENUE BRIDGE.

Salary of Tender, April and May, 1863.....	\$130.00		
Carpenter work .....	93.94		
Iron work and tools.....	33.50		
Lumber.....	48.37		
Blacksmith's work.....	8.03		
Labor, \$12 ; Iron Pump, \$8 ; Coal, \$20 ....	40.00		
Repairs on Bridge.....	233.54	587.38	587.38
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Amounts carried forward.....	\$63,079.74	\$58,646.73
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	CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$63,079.74	\$58,646.73

## ERIE STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$130.00		
Carpenter work .....	101.55		
Lumber.....	73.64		
Coal .....	21.85		
Blacksmith's work .....	24.06		
Iron work and tools.....	8.61		
Salamander stove, pipe, etc.....	11.53		
Roofing bridge house.....	3.50		
Lathing and plastering .....	16.48		
Repairs on Bridge.....	185.80		
Repairing pump.....	1.50	578.52	578.52

## INDIANA STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$130.00		
Carpenter work .....	53.31		
Lumber.....	19.09		
Roofing house.....	3.50		
Lathing and plastering house. ....	16.48		
Blacksmith's work .....	4.38		
Coal .....	15.00	241.76	241.76

## KINZIE STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$150.00		
Carpenter work.....	84.64		
Lumber.....	26.56		
Blacksmith's work.....	70		
Paint, etc., \$2.75 ; Coal \$21.85.....	24.60	286.50	286.50

## RUSH STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$200.00		
Carpenter work.....	180.62		
Iron work.....	17.66		
Lumber, \$5.35 ; Nails, \$20.....	25.35		
Coal, \$22.86 ; Oil, 50c.....	23.36		
Blacksmith's work.....	37.37	484.36	

## DEDUCT—

Old iron sold.....	22.57		461.79
Amounts carried forward.....		\$64,670.88	\$60,215.30

	CASH PAYMENT.	TRUE COST.
Amounts brought forward .....	\$64,670.88	\$60,215.30

## NEW RUSH STREET BRIDGE.

Fox & Howard, amount of contract....	\$8,900.00	
Use of dredges.....	2,177.50	
Labor on wreck of old bridge .....	132.00	
Work on center pier.....	543.73	
Carpenter work, \$259.16; Lumber, \$73.51..	332.67	
Watching wreck at night....	30.00	
Covering timbers with composition... ..	49.20	
Blacksmith's work....	95.66	
Building and plastering bridge house.....	88.83	
Tug "Union," cost of new propeller to replace one damaged by obstructions in river....	243.00	
Tools and hardware, \$16.75; new bell, \$12..	28.75	
Twenty-six new piles, and driving.....	523.95	
Repairing drills, \$29.15; Towing scows, \$12,	41.15	
Rope.....	22.16	
Advertising for proposals.....	57.40	
Stone cutting .....	42.25	
Nails and Spikes .....	15.56	13,323.81
<hr/>		
DEDUCT—		
Old iron sold....	\$3,148.35	10,175.46

## CLARK STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$200.00	
Carpenter work, \$585.06; Labor, \$63.75...	648.81	
Lumber, \$127.13; Iron work, \$26.24.....	153.37	
Damage to schooner "Harrison" .....	20.00	
Tools, \$7.15; Nails, \$26.25; Coal, \$15.....	48.40	
Thirty-five white oak piles ....	241.38	
Oak lumber.....	183.30	
Blacksmith's work.....	43.83	
Fourteen new piles, and driving fifty-eight...	636.35	2,175.44
<hr/>		
ADD—		
Old iron from Rush street bridge.....	\$22.57	2,198.01

## WELLS STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$240.00		
Carpenter work.....	155.31		
Lumber, 92c; Blacksmith's work, \$12.78...	13.70		
<hr/>			
Amounts carried forward.....	\$409.01	\$80,170.13	\$72,588.77



		CASH PAYMENT.	TRUE COST.
Amounts brought forward .....	\$409.01	\$80,170.13	\$72,588.77
Coal .....	23.50		
Six new piles and driving.....	120.90		
Iron work and tools .....	294.63		
Painting.....	296.00	1,144.04	1,144.04

## LAKE STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$180.00		
Carpenter work.....	452.57		
Lumber.....	42.02		
Piles and driving.....	112.50		
Seven new piles and driving.....	141.05		
Iron work and tools.....	17.65		
Paint, oil, etc.....	13.45		
Blacksmith's work, \$37.09; Coal, \$15.....	52.09	1,011.23	1,011.33

## RANDOLPH STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$180.00		
Carpenter work.....	148.05		
Lumber .....	20.00		
Repairing plaster of house.....	13.00		
Railroad iron .....	17.40		
Wheels for turn table .....	61.04		
Blacksmith's work. ....	21.47		
Coal, \$20; Iron work, tools, etc., \$96.32 ...	116.32		
Three new piles, and driving .....	60.45		
Paint, oil, etc. ....	5.69		
Advertising for proposal for new bridge.....	16.50	659.92	659.92

## MADISON STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$180.00		
Carpenter work.....	145.43		
Lumber, \$4.40; Oil, \$1.94.....	6.34		
Wheels, blocks, patterns, etc. ....	49.82		
Coal, \$20; blacksmith's work, \$18.52.....	38.52		
Iron work and tools \$51.09; Nails \$15 ....	66.09	486.20	486.20

## VAN BUREN STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$180.00		
Carpenter work .....	179.45		
Amounts carried forward.....	\$359.45	\$83,471.62	\$75,890.26

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$359.45	\$83,471.62	\$75,890.26
Lumber .....	84.37		
Pulling piles .....	12.00		
Building house.....	65.00		
Iron work, tools, etc. ....	2.05		
Blacksmith's work .....	9.78		
Painting.....	30.25		
Coal .....	20.72		
		583.62	583.62

## POLK STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$150.00		
Carpenter work.....	177.00		
Lumber, \$22.90 ; chain, \$87.54.....	110.44		
Repairs of bridge .....	178.05		
Recovering chain.....	10.00		
Towing bridge to dry dock.....	20.00		
Blacksmith's work.....	5.38		
Iron pump, etc. ....	9.50		
Coal .....	12.86		
Stove, pipe, etc., \$6.75 ; Rope, \$1.28.....	8.03		
Iron work, tools, etc. ....	30.59		
		711.85	711.85

## TWELFTH STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$150.00		
Carpenter work .....	183.31		
Lumber .....	13.22		
Coal .....	18.69		
Lathing and plastering .....	40.20		
Blacksmith's work .....	14.56		
Iron pump .....	8.00		
Iron work, tools, etc. ....	11.22		
		439.20	439.20

## OLD STREET BRIDGE.

Salary of Tender, April and May, 1863.....	\$150.00		
Carpenter work .....	161.44		
Lumber ... ..	66.66		
Repairs of bridge.....	197.64		
Towing bridge to and from dry dock .....	58.00		
Tin pump.....	4.75		
Blacksmith's work.....	28.68		
Amounts carried forward .....	\$667.17	\$85,206.29	\$77,624.93

		CASH PAYMENT.	TRUE COST.
Amounts brought forward.....	\$667.17	\$85,206.29	\$77,624.93
Coal .....	15.00		
Iron work, tools, etc. ....	20.46	702.63	702.63

## WESTERN AVENUE BRIDGE.

A. Salisbury and L. Dodge, half expense of bridge over Mud Lake .....		172.50	172.50
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## EGAN AVENUE BRIDGE.

Lumber .....		103.04	103.04
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## HALSTED STREET BRIDGE.

Salary of Tender, April and May, 1863 ....	\$120.00		
Carpenter work .....	57.37		
Iron and brasswork .....	39.48		
Tools, \$1.50; Coal, \$20.....	21.50	238.35	238.35

## ARCHER ROAD BRIDGE.

Salary of Tender .....	\$87.00		
Carpenter work .....	25.63		
Iron work .....	4.10		
Repairing pump, etc.....	3.34	120.07	120.07

## REUBEN STREET BRIDGE.

Carpenter work .....	\$39.93		
Iron work ....	9.72	49.65	49.65

## OFFICE EXPENSES AND SALARIES.

Salaries of Commissioners ...	\$2,499.96		
“ Secretary .....	633.34		
“ Engineer .....	1,200.00		
“ Asst. Superintendent....	466.67		
“ Clerks .....	2,529.18		
Blank books and stationery .....	218.17		
Advertising and daily papers....	372.78		
Printing, (including report of April 1, 1863).	379.57		
Office fixtures and repairs.....	100.33		
Printing maps.....	25.00		
Entering addition to city atlas .....	100.00		
Amounts carried forward.....	\$8,525.00	\$86,592.53	\$79,011.17

	CASH PAYMENT.		TRUE COST.
Amounts brought forward.....	\$8,525.00	\$86,592.53	\$79,011.17
Draughtsmen .....	98.00		
City maps .....	39.84		
Scientific books .....	27.77		
Stamps.....	28.26		
Sub. to Wells' Commercial Express .....	17.00		
Miscellaneous .....	113.39	8,849.26	
DEDUCT—			
Amount erroneously charged.....	\$12.45		8,836.81

## CHICAGO HARBOR.

Dredge work and inspecting.....	\$278.25		
Timber, piles, and use of driver.....	374.76		
Removing sunken boats .....	82.00		
Taking soundings.....	121.00		
Labor.....	37.65		
Inspecting dredging.....	208.00		
Stone .....	12.60		
Carpenter work .....	5.13		
Surveys of ditch at Mud Lake.....	82.50		
Towing pile driver.....	6.00		
Rope and Lines .....	28.24		
Services of propellers .....	100.00		
Lettering dredges.....	80		
Dredging river near Rush street bridge.....	1,480.00	2,816.93	
DEDUCT—			
Inspecting, erroneously charged,	\$208.00		
Stone,                   “                   “	12.60		
	<u>\$220.60</u>		2,596.33

## PUBLIC PARKS.

Trees, planting, and labor on parks.....	\$703.56		
Repairs of fountain at Court House .....	35.49		
Salary of Superintendent .....	33.33		
Lumber .....	50.28		
Work on fence, Dearborn Park.....	156.56		
Lettering signs.....	6.00		
Locks, tools, etc.....	4.30	989.52	
DEDUCT—			
Hay sold .....	70.00		919.52
Amounts carried forward.....		\$99,248.24	\$91,363.83

	CASH PAYMENT.	TRUE COST.
Amounts brought forward....	\$99,248.24	\$91,363.83

## INTERSECTIONS OF STREETS.

Paving intersections on S. Water street ....	\$256.89	
Grading " Market street.....	109.06	
" " Rue San Honore...	5.33	
Planking " Alley, B. 46, O. T...	9.32	
Dredging river, Bridge street.....	69.96	
" " Hickory street.....	69.96	
" " Archer road.....	84.80	
" " A. Lynch's subdivision .....	26.28	
" " Clark and Randolph streets.	870.00	
Planking alley, B. 46, O. T.....	34.24	
Paving intersection of Clark and Madison ..	1,174.00	
Pat. Rorke, grading.....	56.32	2,766.16

## DEDUCT—

Refunded by C. Railway Co. for intersec. Clark and Madison, \$282.20	2,483.96
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## CANAL STREET IMPROVEMENT.

Hervey Nash, on contract per C., B. and Quincy R. R. Co.	1,239.69
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## STONE ACCOUNT.

Stone purchased, not used .....	120.00	120.00
Total cash expenditures .....	\$103,374.09	\$93,967.79
Balance in Treasurer's hands, April 1, 1864.....	35,088.78	
	<u>\$138,462.87</u>	

## SPECIAL ASSESSMENTS.

## NORTH CLARK STREET IMPROVEMENT.

Balance unexpended, April 1, 1863 .....	\$471.00	
Labor and materials, paid .....		\$471.00

## LAKE STREET IMPROVEMENT.

Balance unexpended, April 1, 1863 .....	\$528.80	
De Golyer & McClelland, balance .....		\$528.80

## SOUTH WATER STREET IMPROVEMENT.

Balance unexpended, April 1, 1863 .....	\$131.90	
Paid F. Hathaway, rebate .....	50.98	
Balance to apply on expenses.....		\$80.92

## SOUTH MARKET STREET IMPROVEMENT.

Amount of assessment roll for Macadamizing South Market, from Madison to Van Buren Street....	\$4,762.00	
Amount second assessment for same.....	695.00	
Estimates paid Hervey Nash.....	\$5,350.00	\$5,457.00
Services of Inspector .....	107.00	
		\$5,457.00

## KINZIE AND NORTH WATER STREET IMPROVEMENTS.

Balance unexpended, April 1, 1863.....		\$4,012.08
Estimates paid De Golyer and McClelland .....	\$3,614.09	
Parker & Bro., damages .....	1.70	
Services of Inspector .....	26.00	
		3,641.79
Balance unexpended, to apply on expenses.....		\$370.29

## SIDEWALK IMPROVEMENTS.

Balance unexpended, April 1, 1863.....	\$8.00	
Assessment for constructing sidewalk Block 17, Bushnell's Addition.....	12.16	
Assessment for re-laying sidewalk in front of Lots 12, 13 and 18, in Block 135, School Section ...	153.75	
Assessment for repairing sidewalk in front of Lot 19, N. $\frac{1}{2}$ Lot 24, Block 135, S. Section .....	4.84	
Amount carried forward.....	\$178.75	



Amount brought forward.....	\$178.75	
Assessment for re-laying sidewalk of Lot 16, Gurley's Subdivision, N.E. $\frac{1}{4}$ Sec. 2 $\frac{1}{2}$ , 39, 14 .....	21.90	\$200.65
Rebate to Conn. Mut. Life Insurance Company....	\$12.16	
Elliott & Thurlow, relaying and repairing sidewalks.	180.49	192.65
Balance to apply on expenses.....		\$8.00

## WEST LAKE STREET IMPROVEMENT.

Assessment roll for paving West Lake Street with Nicholson pavement, from the river to west side of Halsted street .....		\$45,438.20
Estimates paid De Golyer & McClelland .....	\$12,392.69	
Rebate to Henry Weber, for building curb walls....	359.11	
Rebate to B. Bernauer .....	245.38	
" Dr. M. Parker .....	11.80	
" T. M. Avery .....	28.44	
Services of Inspector.....	220.00	
Advertising .....	13.75	13,271.17
Balance unexpended. ....		\$32,167.03

## CANAL STREET IMPROVEMENT.

Assessment roll for grading and Macadamizing Canal street, from Lake street to Fulton street .....		1,212.00
Estimates paid H. Nash .....		1,180.00
Balance unexpended .....		\$32.00

## IMPROVEMENT OF ALLEY IN BLOCK 46, KINZIE'S ADDITION.

Assessment roll for opening Alley through Block 46, Kinzie's Addition.....		\$230.00
W. S. McCormick, damages .....		100.00
Balance unexpended .....		\$1.30

## IMPROVEMENT OF ALLEY IN BLOCK 46, O. T.

Assessment for planking Alley running N. & S. through continuation of B. 46, O. T.....		\$606.84
Estimates paid H. Witbeck & Co.....		606.84

OPENING ALLEY S.W.  $\frac{1}{4}$  LOT 5, B. 64, C. T. SUB. SEC. 7, 39, 14.

Assessment for opening Alley E. and W. through centre of W. 90 ft. Lot 2 and B. 64, Canal Trust. Sub., Sec. 7, 39, 14 .....		\$239.95
Damages allowed J. F. Smith.....		100.00
Balance unexpended .....		\$139.95

## NORTH CLARK STREET IMPROVEMENT.

Assessment roll for grading North Clark street, from its intersection with Wells street to the centre of Fullerton avenue .....		\$4,346.13
W. H. Turner, estimates paid.....	\$3,100.96	
Services of Inspector .....	105.60	
Rebate to M. Porter .....	59.12	
“ J. Atwater .....	10.28	
“ W. Barry .....	104.87	
	<hr/>	3,380.83
Balance unexpended.....		<u><u>\$965.30</u></u>

## NORTH CLARK STREET IMPROVEMENT.

Assessment for straightening North Clark street, between North avenue and Fullerton avenue.....		<u><u>\$860.00</u></u>
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## WELLS STREET IMPROVEMENT.

Assessment for paving Wells street with Nicholson pavement, from Madison street to Van Buren st..		\$33,259.82
Rebate to Est. J. High, jr.....	\$43.20	
“ J. W. Scoville, Ag't.....	371.25	
“ C. H. J. Miller .....	13.23	
	<hr/>	427.68
Balance unexpended .....		<u><u>\$32,832.14</u></u>

## WABASH AVENUE IMPROVEMENT.

Assessment for paving Wabash avenue with Nicholson pavement, from Randolph to Fourteenth st..		\$98,207.48
Van H. Higgins, rebate.....	\$14.40	
O. Smith, rebate .....	36.74	
	<hr/>	51.14
Balance unexpended ...		<u><u>\$98,166.34</u></u>

## CANAL STREET IMPROVEMENT.

Assessment roll for re-Macadamizing Canal st., from Twelfth street to track of the south branch of G. & Chic. Union R. R. ....		\$2,685.56
Estimates paid H. Nash.....	\$1,712.17	
Service of Inspector .....	126.40	
	<hr/>	1,838.57
Balance unexpended .....		<u><u>\$846.99</u></u>

## CLARK STREET IMPROVEMENT.

Assessment roll for paving Clark street with Nicholson pavement, from north side of Polk street to the north side of Taylor street .....	\$15,805.53
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## RANDOLPH STREET IMPROVEMENT.

Assessment roll for repaving Randolph street with Nicholson pavement from the west side of State street to the west side of the east approach to the bridge at Randolph street .....	\$25,384.57
Assessment annulled by Common Council, Dec. 21, 1863 .....	\$25,384.57

## LUMBER STREET IMPROVEMENT.

Assessment roll for grading and planking Lumber street from south line of lot 1, block 4, Canal Trustees' Sub. W. $\frac{1}{2}$ Sec 21, etc., to its intersection with track of C., P. & Ft. Wayne Railroad..	\$2,800.68
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## SOUTH WATER STREET IMPROVEMENT.

Assessment roll for paving South Water Street with Nicholson pavement, from the east line of Wabash avenue to the west line of Michigan avenue.....	\$2,860.67
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## MILWAUKEE AVENUE IMPROVEMENT.

Assessment roll for Macadamizing Milwaukee avenue, from Elston road to the center of North avenue .....	\$13,378.38
Estimates paid J. McMahon .....	\$7,408.52
Services of Inspector .....	186.90
	7,595.42
Balance unexpended.....	\$5,782.96

## IMPROVEMENT OF ALLEY IN B. 7, FT. DEARBORN ADD.

Assessment roll for grading and planking alley running east and west in B. 7, Ft. Dearborn Add.; also alley running north from said east and west alley to South Water street.....	\$910.64
Estimates paid A. Salisbury and L. Dodge .....	888.48
Balance unexpended.....	\$22.16

## BENTON PLACE IMPROVEMENT.

Assessment roll for grading and planking Benton place, between State street and Wabash avenue..	\$1,132.82
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## IMPROVEMENT OF ALLEY, B. 46, O. T.

Assessment roll for filling, grading, and planking alley running north and south through the center of B. 46, O. T.....	\$323.16
Witbeck & Co., damages.....	6.06
Balance unexpended .....	\$317.10

## HOLT STREET IMPROVEMENT.

Assessment roll for the extension of Holt street, from Clarinda street to Cornell street.....	\$520.00
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## WALNUT STREET IMPROVEMENT.

Assessment roll for the extension of Walnut street, through east $\frac{1}{2}$ B. 45, C. T. Sub. Sec. 7, 39, 14...	\$490.37
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## IMPROVEMENT OF ALLEY, B. 45, SEC. 7, 39, 14.

Assessment roll for the extension of alley, 18 feet in width, in west $\frac{1}{2}$ B. 45, through Assessors' subdivision of east half of said block.....	\$334.55
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## FOURTEENTH STREET IMPROVEMENT.

Assessment roll for the extension of Fourteenth st., fifty feet wide, from State st. east to Indiana av..	\$22,075.00
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## DREDGING SOUTH BRANCH OF CHICAGO RIVER AT QUARRY STREET.

Assessment roll for dredging and deepening Chicago river, between Quarry street and forks of the So. Branch, near Ills. & Mich. Canal .....	\$19,479.00
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## DREDGING SOUTH BRANCH OF CHICAGO RIVER, NEAR BRIDGEPORT.

Assessment roll for dredging and deepening the Chicago river, so as to admit of the passage of vessels from its junction with Ills. & M. C. to the south line of property of Messrs. J. A. Lightall & Co. and Stone & Co. ....	\$3,710.00
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## EIGHTEENTH STREET IMPROVEMENT.

Assessment roll for straightening Eighteenth street, from the west line of the So. Branch of Chicago river to the east line of Lumber street.....	\$3,520.00
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## RUE SAN HONORE IMPROVEMENT.

Assessment roll for grading Rue San Honore, from Madison street to Adams street....	\$49.00
P. Rorke, grading.....	\$49.00
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## JACKSON STREET IMPROVEMENT.

Assessment roll for grading Jackson street, from S. W. Plank road to Josephine street.....	\$82.18
P. Rorke, grading.....	\$82.18
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## SIDEWALK IMPROVEMENT IN FRONT OF B. 2, SEC. 17, 39, 14.

Assessment roll for rebuilding sidewalks in front of lots 11, 12, 13, 14, 21, and 22, B. 2, Sec. 17, 39, 14,	\$129.60
E. S. Hurlbut, rebate.....	\$24.00
D. Leilenthal, rebate.....	19.20
B. Bartelme, rebuilding .....	43.20
	<hr/>
	86.40
Balance unexpended.....	\$43.20
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## DREDGING BAR AT MOUTH OF HARBOR.

Fox & Howard, dredging 44,522.74-100 cubic yards	\$18,922.49
Services of Inspectors .....	632.00
Iron bolts and stone for buoys.....	72.60
Marking and painting buoys .....	22.75
Advertising for proposals.....	9.50
	<hr/>
	\$19,659.34
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## WIDENING AND DEEPENING SOUTH BRANCH OF CHICAGO RIVER,

NEAR VAN BUREN STREET BRIDGE.

Fox & Howard, estimates paid.....	\$8,000.00
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## LAMP POST ASSESSMENTS.

## POLK STREET.

Assessment for the erection of ten lamp posts, from Canal to Foster.....	\$320.00
Bouton & Co., account ten lamp posts .....	\$138.13
F. Hartman, account ten lamps.....	35.00
	<hr/>
	173.13
Balance unexpended .....	\$146.87
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## JEFFERSON STREET.

Assessment for the erection of two lamp posts, between Ewing and Polk streets.....		\$64.00
Bouton & Co., account two lamp posts.....	\$27.63	
F. Hartman, account two lamps .....	7.00	
T. Larkins, rebate .....	14.00	
C. Malone, rebate.....	10.90	
	<hr/>	59.53
Balance unexpended.....		<hr/> \$4.47 <hr/>

## JEFFERSON STREET.

Assessment for the erection of six lamp posts, between Harrison and Polk streets.....		\$192.00
People's Gas L. & C. Co., for service pipe, etc.....	\$40.00	
Bouton & Co., acc't six lamp posts .....	82.88	
F. Hartman, acc't six lamps .....	18.00	
	<hr/>	140.88
Balance unexpended .....		<hr/> \$51.12 <hr/>

## MATHER STREET.

Assessment for the erection of six lamp posts, between Canal and Jefferson .....		\$192.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$50.00	
Bouton & Co., acc't six lamp posts .....	82.88	
F. Hartman, acc't six lamps .....	18.00	
	<hr/>	130.88
Balance unexpended ..		<hr/> \$61.12 <hr/>

## FULTON STREET.

Assessment for the erection of five lamp posts, between Peck and Reuben streets.....		\$160.00
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## FULTON STREET.

Assessment for the erection of three lamps posts, between Sangamon and Morgan streets.....		\$96.00
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## SANGAMON STREET.

Assessment for the erection of two lamp posts, between Carroll and Fulton streets.....		\$64.00
Bouton & Co., acc't two lamp posts .....		27.63
Balance unexpended .....		<hr/> \$36.37 <hr/>



## JACKSON STREET.

Assessment for the erection of four lamp posts, between Throop and Loomis streets .....		\$128.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$20.00	
Bouton & Co., acc't four lamp posts .....	55.25	
F. Hartman, acc't four lamps.....	8.00	
	<hr/>	83.25
Balance unexpended .....		<hr/> <hr/> \$44.75

## WEST JACKSON STREET.

Assessment for the erection of 5 lamp posts, between Halsted and Desplaines street .....		\$160.00
People's Gas L. & C. Co., acc't service pipe.....	\$25.00	
Bouton & Co., acc't five lamp posts .....	69.06	
F. Hartman, acc't five lamps ....	17.50	
	<hr/>	111.56
Balance unexpended ... ..		<hr/> <hr/> \$48.44

## ST. JOHN'S PLACE.

Assessment for the erection of three lamp posts, between Lake and Fulton streets .....		\$96.00
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## SHELDON STREET.

Assessment for the erection of two lamp posts, between Randolph and Washington streets.....		\$64.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$10.00	
Bouton & Co., acc't two lamp posts.....	27.62	
F. Hartman, acc't two lamps.....	7.00	
	<hr/>	44.62
Balance unexpended.....		<hr/> <hr/> \$19.38

## TAYLOR STREET.

Assessment for the erection of seven lamp posts, between Canal and Jefferson streets.....		\$224.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$20.00	
Bouton & Co., acc't seven lamp posts....	96.69	
F. Hartman, acc't four lamps... ..	21.00	
	<hr/>	137.69
Balance unexpended.....		<hr/> <hr/> \$86.31

## WEST ADAMS STREET.

Assessment for the erection of sixteen lamp posts, between Canal and Halsted streets.....		\$512.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$30.00	
Bouton & Co., acc't fourteen lamp posts.....	193.37	
F. Hartman, acc't lamps.....	21.00	
	<hr/>	244.37
Balance unexpended .....		<u>\$267.63</u>

## WEST ADAMS STREET.

Assessment for the erection of eight lamp posts, be- tween Rucker and Morgan streets.....		\$256.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$40.00	
Bouton & Co., acc't eight lamp posts.....	110.50	
F. Hartman, acc't eight lamps.....	23.00	
Rebate to T. Lattan.....	3.16	
	<hr/>	176.66
Balance unexpended. ....		<u>\$79.34</u>

## CLINTON STREET.

Assessment for the erection of twenty-four lamp posts, between Maxwell and Polk Streets.....		\$768.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$120.00	
Bouton & Co., acc't twenty-four lamp posts.....	331.50	
F. Hartman, acc't twenty-four lamps.....	84.00	
	<hr/>	535.50
Balance unexpended.....		<u>\$232.50</u>

## PEORIA STREET.

Assessment for the erection of two lamp posts, be- tween Randolph and Lake streets.....		\$64.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$10.00	
Bouton & Co., acc't two lamp posts .....	27.62	
F. Hartman, acc't two lamps .....	2.00	
	<hr/>	39.62
Balance unexpended.....		<u>\$24.38</u>

## WEST LAKE STREET.

Assessment for the erection of twenty-five lamp posts, between Paulina and Leavitt streets.....		\$800.00
Bouton & Co., acc't twenty-five lamp posts.....		345.21
Balance unexpended.....		<u>\$454.69</u>

## LOOMIS STREET.

Assessment for the erection of six lamp posts, from Jackson to half way between Van Buren and Tyler streets.....		\$192.00
People's Gas L. & C. Co., acc't service pipe .....	\$30.00	
Bouton & Co., acc't six lamp posts.....	82.87	
F. Hartman, acc't six lamps....	21.00	
	<hr/>	133.87
Balance unexpended. ....		<hr/> <hr/> \$58.13

## DESPLAINES STREET.

Assessment for the erection of sixteen lamp posts, from Harrison to 250 feet north of Adams street,		\$512.00
People's Gas L. & C. Co., acc't service pipe.....	\$85.00	
Bouton & Co., acc't sixteen lamp posts.....	221.00	
F. Hartman, acc't sixteen lamps.....	56.00	
	<hr/>	362.00
Balance unexpended.....		<hr/> <hr/> \$150.00

## WARREN STREET.

Assessment for the erection of twenty lamp posts, between Reuben and Robey streets.....		\$640.00
People's Gas L. & C. Co., acc't service pipe.....	\$70.00	
Bouton & Co., acc't seventeen lamp posts.....	234.82	
F. Hartman, acc't fourteen lamps.....	49.00	
Rebate to M. Nelson .....	13.96	
	<hr/>	367.78
Balance unexpended ...		<hr/> <hr/> \$272.22

## ABERDEEN STREET.

Assessment for the erection of four lamp posts, between Monroe and Adams streets.....		\$128.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$10 00	
Bouton & Co., acc't four lamp posts....	55.24	
F. Hartman, acc't two lamps.....	7.00	
Rebate to Mrs. C. A. Andrews.....	14.40	
	<hr/>	86.64
Balance unexpended .....		<hr/> <hr/> \$41.36

## TWELFTH STREET.

Assessment for the erection of three lamp posts, between Clinton and Jefferson streets... ..		\$96.00
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## JUDD STREET.

Assessment for the erection of five lamp posts, between Canal and Jefferson streets.....		\$160.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$25.00	
Bouton & Co., acc't five lamp posts.....	69.06	
F. Hartman, acc't five lamps.....	17.50	
	<hr/>	111.56
Balance unexpended.....		<hr/> <hr/> \$48.44

## DEPUYSTER STREET.

Assessment for the erection of three lamp posts, to a point 450 feet west of Desplaines street.....		\$96.00
Gas Light Co., acc't service pipe .....	\$15.00	
Bouton & Co., acc't three lamp posts.....	41.44	
F. Hartman, acc't three lamps.....	10.50	
	<hr/>	66.94
Balance unexpended .....		<hr/> <hr/> \$29.06

## WEST VAN BUREN STREET.

Assessment for the erection of four lamp posts, between Halsted and Desplaines.....		\$128.00
People's Gas L. & C. Co., acc't service pipe, etc....	\$20.00	
Bouton & Co., acc't four lamp posts.....	55.25	
F. Hartman & Co., four lamps.....	14.00	
	<hr/>	89.25
Balance unexpended.....		<hr/> <hr/> \$38.75

## WEST VAN BUREN STREET.

Assessment for the erection of four lamp posts, from Sangamon to a point 175 feet west of Morgan st.,		\$128.00
People's Gas L. & C. Co., service pipe.....	\$20.00	
Bouton & Co., acc't four lamp posts.....	55.25	
F. Hartman, acc't 4 lamps.....	14.00	
Rebate to S. Hoard .....	6.65	
	<hr/>	95.90
Balance unexpended.....		<hr/> <hr/> \$32 10

## WEST TWELFTH STREET.

Assessment for the erection of five lamp posts, between Blue Island Avenue and Rucker street ...		\$160.00
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## PRICE PLACE.

Assessment for the erection of four lamp posts, between Desplaines and Halsted.....		\$128.00
People's Gas L. & C. Co., acc't service pipe .....	\$20.00	
Bouton & Co., acc't four lamp posts.....	55.25	
F. Hartman, acc't four lamps.....	14.00	
	<hr/>	89.25
Balance unexpended .....		<hr/> <hr/> \$38.75

## PARK AVENUE.

Assessment for the erection of four lamp posts, between Paulina and Reuben streets.....		\$128.00
Bouton & Co., acc't four lamp posts.....		55.25
		<hr/>
Balance unexpended .....		<hr/> <hr/> \$72.75

## WEST MONROE STREET.

Assessment for the erection of fourteen lamp posts, between Canal and Halsted.....		\$418.00
People's Gas L. & C. Co., acc't service pipe.....	\$10.00	
Bouton & Co., acc't fourteen lamp posts .....	193.38	
F. Hartman, acc't two lamps .....	7.00	
	<hr/>	210.38
Balance unexpended .....		<hr/> <hr/> \$237.62

## CARPENTER STREET.

Assessment for the erection of three lamp posts, between Kinzie and Carroll streets.....		\$96.00
Bouton & Co., acc't three lamp posts .....		41.46
		<hr/>
Balance unexpended .....		<hr/> <hr/> \$54.54

## CARROLL STREET.

Assessment for the erection of fifteen lamp posts, between Halsted and Carpenter streets .....		\$480.00
Bouton & Co., acc't fifteen lamp posts.....		207.19
		<hr/>
Balance unexpended.....		<hr/> <hr/> \$272.81

## BLUE ISLAND AVENUE.

Assessment for the erection of six lamp posts, between Maxwell and Mitchell streets .....		\$192.00
Bouton & Co., acc't six lamp posts.....	\$82.88	
Rebate to W. Ruchl .....	4.81	
	<hr/>	87.69
Balance unexpended .....		<hr/> <hr/> \$104.31

## WILLARD PLACE.

Assessment for the erection of two lamp posts, between West Randolph and West Washington..		\$64.00
Bouton & Co., acc't two lamp posts .....	\$27.62	
F. Hartman, acc't two lamps.....	7.00	
	<hr/>	34.62
Balance unexpended .....		<hr/> \$29.38 <hr/>

## PRAIRIE AVENUE.

Assessment for the erection of four lamp posts, between Monterey and Buena Vista .....		\$128.00
Bouton & Co., acc't four lamp posts.....	\$55.25	
F. Hartman, acc't four lamps.....	14.00	
People's Gas L. & C. Co., acc't service pipe .....	34.00	
	<hr/>	103.25
Balance unexpended.....		<hr/> \$24.75 <hr/>

## EIGHTEENTH STREET.

Assessment for the erection of sixteen lamp posts, between State and Grove.....		\$512.00
Bouton & Co., acc't sixteen lamp posts.....	\$221.00	
F. Hartman, acc't sixteen lamps .....	56.00	
People's Gas L. & C. Co., acc't service pipe.....	136 00	
Rebate to J. Brennan .....	15.94	
	<hr/>	428.94
Balance unexpended .....		<hr/> \$83.06 <hr/>

## GROVE STREET.

Assessment for the erection of four lamp posts, between Eighteenth and Nineteenth streets.....		\$128.00
People's Gas L. & C. Co., acc't service pipe.....	\$34.00	
F. Hartman, acc't four lamps.....	14.00	
	<hr/>	48.00
Balance unexpended.....		<hr/> \$80.00 <hr/>

## MICHIGAN AVENUE.

Assessment for the erection of five lamp posts, between Buena Vista and Rio Grande....		\$160.00
Bouton & Co., acc't five lamp posts.....	\$69.06	
People's Gas L. & C. Co., acc't service pipe .....	51.00	
F. Hartman, acc't five lamps .....	17.50	
	<hr/>	137.56
Balance unexpended .....		<hr/> \$22.44 <hr/>



## HARMON COURT.

Assessment for the erection of two lamp posts, between State and Michigan avenue.....	\$64.00
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## DEARBORN STREET IMPROVEMENT.

Assessment for widening Dearborn street, from the south line of Madison street to centre of Block 119, School Section Addition.....		14,600.00
Mrs. C. O. Fuller, land damages .....	\$7,250.00	
O. Lunt, trustee, etc., " .....	7,250.00	
		<u>14,500.00</u>
Balance to apply on expense of assessment.....		<u>\$100.00</u>

# APPENDIX.

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## LAKE TUNNEL CONTRACT.

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### SPECIFICATIONS FOR LAKE TUNNEL.

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#### LOCATION AND GENERAL DESCRIPTION.

The tunnel is to commence at such point as may be selected by the Board of Public Works, on the lot now occupied by the pumping works of the city of Chicago, at the east end of Chicago avenue, and on the shore of Lake Michigan; and to extend two miles out under the lake, in a straight line, at right angles to the general direction of the shore.

The bottom of the inside surface of the east end of the tunnel shall be sixty-six feet below the ordinary level of the lake, or sixty-four feet below what is usually known as "City Datum;" and the bottom surface shall descend uniformly at the rate of two feet per mile to the west end of the tunnel.

There are to be one land and two to four lake shafts; the land shaft at the west end, one lake shaft at the east end, and the remaining lake shaft or shafts at such intermediate points as shall be determined upon by said Board, when the proper time for locating them shall arrive. The lake shafts are to consist of cast iron cylinders, and to be protected by hollow pentagonal cribs.

The tunnel is to be very nearly circular in form, and to have an interior width of five feet, and height of five feet and two inches.

#### CRIBS.

It has been proposed to construct four cribs, on the supposition that this number might be required to complete the tunnel in two years, but if, after commencing the work, it shall be found in time that one or more of them may be omitted, such omission shall be made; and for this

reason but two cribs shall be commenced before the probable rate of progress in the tunnel, from the land shaft, shall have been satisfactorily ascertained.

#### DESCRIPTION.

The cribs are to be five-sided, each outer side to be fifty-eight feet long. There is to be a central space in each crib, in form similar to the outside, leaving the thickness between the central space and outside of the crib twenty-five feet. The interior and exterior sides of the cribs are to be perpendicular from their bottoms to their tops, which are to be five feet above the ordinary surface of the lake; hence, the outermost crib is to be forty feet high. The height of the others will depend upon their location, which will be determined during the progress of the work.

The outer crib is to have three openings through its sides, one opening through each of the western and southern sides; each opening to be five feet high and four feet wide, and to be connected with the top of the crib by a well four feet square. The most northern opening is to have its bottom five feet above the bottom of the crib, the middle one eleven feet higher, and the southern one eleven feet higher than the middle. Each opening is to be furnished with an iron paddle gate, to be worked by means of an iron rod, from the top of the crib, as shown on plans No. 9 and 10.

Each crib is to be provided with two gates, each two feet high, and one and a half feet wide, placed five feet above the bottom of the crib, and against the wall of the inside space. These gates to be used for regulating the sinking of the cribs to their places, and worked by rods from the top of the crib, as shown on plans No. 11 and 12. Wrought iron gratings to protect these gates must be provided as shown on these plans.

#### MODE OF CONSTRUCTION.

The bottom of each crib shall be formed by an outer, inner, and middle line of twelve-inch square white pine timber, which shall be connected with cross timbers of the same size, and with twelve by three inch joists placed two feet apart from center to center, and the under side of the whole, except the central space of the crib, sheathed over with two inch pine plank, fastened on by six inch spikes driven through each plank in every timber and joist, as shown on plan No. 5. All the timbers and cross timbers are to be connected by dovetail joints the full width of each timber, and of equal depth in each, the dovetail being

one inch deeper at its end than at its shoulder. On the outer, inner, and middle lines of timber, and on the angle pieces of the outer and middle lines, solid walls of twelve inch square timber are to be built up to a height of forty feet above the bottom for the outer crib, and to a height of five feet above ordinary water mark, for the other cribs. The middle wall extends solid from outside to outside of the crib; the inner wall only around the inner space. The angle timbers are eleven and a half feet long from tip to tip. Between the outer and middle walls there are two lines of cross timbers on each side of the crib, and between the middle and inner walls, three lines. The cross timbers are twelve inches square, placed twelve inches apart above each other, and extend through each wall. All of the timber and lumber, except the upper twelve feet in each outside wall, is to be of sound white pine. The upper twelve feet of the outer wall to be of sound white oak, free from sap, or any imperfections tending to hasten decay. All of the joints of the timbers at the angles of the outer and inner walls, at the ends of the middle walls, and at the ends of the cross timbers, are to be dovetailed like those described for the bottom course of timbers in the crib. Where the timbers of the middle wall cross each other, they are to be notched half and half. Whenever the ends of timbers butt against each other in the outer and inner walls, they must do so at the center of the end of some cross timber, where the dovetailed end can be made to lap over the butt joint. (See plan No. 2.) On the bottoms and sides of the three openings through the outer crib, twelve inch square timbers touching each other are to be run entirely through the ends; and across the top of the openings six inch plank are to be spiked, fitting close to each other. The walls from each opening to the top of the crib are to be formed of six inch plank placed horizontally, and notched into the crib timbers wherever they can be. See plans No. 1, 2, 3 and 4.

The timbers in the outer and middle walls of each crib are to be fastened to each other by  $1\frac{5}{16}$  inch square wrought iron bolts thirty inches long, with ragged edges, and driven into the timber at an angle twelve degrees from a perpendicular, and inclining alternately towards each other, as shown on plan No. 2. The timbers of the inner wall are to be fastened in a similar manner to those of the outer and middle, except that the bolts are to be but one inch square.

Each outer angle of the crib is to be protected by a covering of wrought iron one inch thick, extending two feet each way from the corner, and from the top of the crib downwards ten feet. These angle irons

are to be fastened on by round wrought iron one and a-half inch bolts, one through every timber, on each side of the corner. The bolts are to be alternately long and short, the long being fastened through the middle timbers of the crib, and the short through the outer timbers, as shown on plans No. 6, 7 and 8. The long bolts are to be used also in the lower part of the crib, from the bottom to the angle iron, in every other timber.

The spaces between the joists at the bottom of the crib are to be filled with gravel or broken stone flush with the tops of the joists. The joists are to be planked over with two inch pine, fastened down with six inch spikes.

There are to be twenty-five pairs of one-inch round wrought iron rods to connect saddles placed under bottom timbers and over top ones, as shown on plans No. 1, 3 and 5. The forms and mode of placing the saddles and connecting the rods with them and with each other are shown on plans No. 23, 24 and 25.

The whole of the joints on the bottom of the crib, around the outside and central space of the crib from its bottom to within four feet of the top, and the joints around the inside of the three openings and their wells, are to be thoroughly calked with oakum and paid with tar.

Each crib shall, immediately after being towed to its proper position, be secured by one and a-half inch iron cables to five Mitchell's mooring screws, forced ten feet into the clay at the bottom of the lake. The dimensions and form of these screws can be seen on plans No. 26 and 27.

Each crib is to be filled with sound rubble stone, from its bottom to its top, as soon after being moored as practicable.

The angles of each crib shall be placed exactly in such positions as the Board of Public Works may direct.

#### THE LAND SHAFT.

This will be located near and in the rear of the present pumping works of this city. From the surface of the ground to a depth of fifteen feet below the level of the lake, the shaft is to be twelve feet in diameter; and then it is to be contracted by a sloping offset of three feet all around to six feet diameter, to five feet below the bottom of the invert of the tunnel, a distance of sixty feet.

The whole of the shaft is to be lined with brick masonry twelve inches thick, where the shaft is twelve feet in diameter, and eight inches thick, where it is six feet diameter, and on the invert at its bottom. The ma-



sonry of the offset is to be twelve inches thick. See plans No. 13, 14 and 15.

The masonry is to be formed of hard-burnt, clear ringing, and well formed bricks, entirely free from lime, not less than eight inches long, two and a quarter inches thick, and four inches wide, to be laid upright in cement mortar, and in rings or shells four inches thick. The courses must be horizontal, the inside surface of the shaft must be true and cylindrical, and the joints between the bricks not over a quarter of an inch on the inside of each ring.

The cement mortar is to be equal to the best of Clark's La Salle, and mixed with one measure of clean sharp sand to one of cement, and used as soon as possible after being mixed.

The joints between the rings must be not less than half an inch, and all the joints in the masonry must be perfectly filled with mortar at the *time* the masonry is laid.

Where the natural soil around the shaft is sand or loose material, there is to be not less than twelve inches of thoroughly puddled clay on the outside of the masonry.

Whatever timber and lumber may be necessary to support the earth around the shaft, before the masonry can be built, must be furnished and put in by the contractor.

The pumping, and all labor and machinery connected therewith, must be done and furnished by the contractor.

#### INLET CYLINDER FOR OUTER LAKE SHAFT.

To be nine feet in diameter, inside, and two and a quarter inches thick. To be made in sections of about nine feet in length, so that seven sections will make up the total length of the cylinder, or sixty-four feet. The flanches to be five and five-eighths inches wide by  $2\frac{1}{4}$  inches thick, and to be faced in the lathe true and at right angles to the center line of the cylinder. Each flanch to have a small annular groove turned into the face, to receive the putty to be used in making the joint, as shown on the drawing. Flanches to be drilled for bolts  $1\frac{1}{2}$  inches diameter and about seven inches between centers. The lower section to be turned a taper of  $\frac{1}{16}$  of an inch, in nine inches from the end on the outside. The balance of the section to be accurately and truly turned parallel the entire length above the taper.

The second and third sections, and, if required, the fourth section, from the bottom to be accurately and smoothly turned, each section of a



diameter slightly in excess of the one next below it, say the 64th part of an inch, and should there be any difference in the diameter of opposite ends of the same section, then the largest end to be connected uppermost. See plans No. 17, 18, 21 and 22. .

The section next below the top one is to be provided with openings for inlet gates; plans and specifications for which will be given to the contractor whenever necessary after one month from the letting of the work, and all additional expense to the contractor in making such opening will be paid for as extra.

#### INTERMEDIATE CYLINDERS FOR LAKE SHAFTS.

To be one to three in number, to be nine feet diameter, inside, and  $1\frac{1}{2}$  inches thick. To be made in sections of about nine feet in length, so that seven sections will make up the total length of cylinder, whether sixty-five, sixty-six or sixty-seven feet. The flanches to be five inches wide by  $1\frac{3}{4}$  inches thick, and faced as specified for the "inlet cylinder." Flanches to be drilled for bolts  $1\frac{1}{2}$  inches diameter, and about seven inches between centers. Three or four of the lower sections to be turned on the outside as may be required, and as specified for the "inlet cylinder." The sections to be stiffened by two intermediate internal flanches  $2\frac{3}{8}$  inches wide by  $1\frac{3}{4}$  inches thick. At the top of the third or fourth section from the bottom, as may be required, the flanch to have a double width to receive a bonnet or head for closing and disconnecting the cylinder at that joint, as delineated on the drawing. See plans No. 19, 20, 21 and 22.

The iron employed in the construction of the cylinders to be of good quality. The castings to be sound and free from sand holes or other defects.

Bolts for connecting the cylinders to be made of the best wrought iron,  $1\frac{1}{2}$  inches diameter, with hexagonal heads and nuts.

Joints between cylinder section flanches to be made air-tight with thin red lead putty. All necessary work, materials, machinery and tools for completing and putting in place the cribs and cylinders to be done and furnished by the contractor.

#### THE TUNNEL PROPER.

The clear width of the tunnel is to be five feet, and the clear height five feet and two inches, the top and bottom arches to be semi-circles. The tunnel is to be lined with brick masonry eight inches thick, in two rings or shells, the bricks to be laid lengthwise of the tunnel with tooth-

ing joints. The mortar, character of materials and workmanship, are to be like those described for the land shaft. See plan No. 16.

The excavation for the tunnel, when through sufficiently firm clay, shall conform exactly to the outside of the masonry on the bottom and sides. On top, just enough of excavation above the masonry will be allowed, to give room to turn and key the upper arch properly. Sections of not over two feet of the upper arch are to be built at a time, and immediately after each section is keyed, the space above it shall be filled with earth, which shall be put into the space in small quantities at a time, and thoroughly rammed until it becomes as solid as the natural soil above.

Should a soil be met with in any part of the tunnel, requiring the sides, bottom and top to be planked and braced before the masonry can be built, filling in, carefully and thoroughly done, shall be put in between the masonry and the boarding, in or between the masonry and sides of the excavation, as is specified for the upper arch in a firm soil. The material for this filling may be dry sand or puddled clay.

All timber and lumber necessary for bracing and supporting the sides of the tunnel and shafts, previous to the completion of the masonry, must be furnished and put in place by the contractor.

The contractor must furnish and put in place all necessary air-pipes, and apparatus for ventilating the tunnel, all pumps, steam engines, hoisting apparatus and fixtures for the same, all sheds and shelters for the protection of workmen and materials on the cribs, and all necessary tracks, trucks and other necessary implements or machinery for removing excavated material out of, and building materials into, the tunnel.

The contractor must also remove all excavated material taken out of each shaft to such points as shall be designated by the Board of Public Works, provided said points shall not exceed three hundred feet from any shaft, and must provide all necessary tug-boats, scows and other means of transportation, and implements required for such removal.

#### GENERAL SPECIFICATIONS.

The contractor shall furnish and maintain such lights as may be necessary to avoid danger to navigation; and in case of failure to do so, shall be liable for all damages the city may have to pay on account of such failure.

All materials, of whatever kind, to be used in the work, are to be in-

spected by the Board of Public Works; and all unsuitable materials are to be immediately removed from the work by the contractor.

The contractor shall discharge from his employment, when directed by the Board of Public Works, all unfaithful and incompetent workmen.

The Board of Public Works must be permitted to remove such portions of the work as they may from time to time think necessary for the discovery of improper materials or workmanship; and the contractor shall restore such work at his own expense, in case it shall have been done improperly; and at the expense of said Board if done in a proper manner.

Any work, materials, machinery or tools necessary for the completion of the tunnel, cribs or shafts, omitted in the plan and specifications, shall be done or furnished by the contractor, and paid for as extra work, at such valuation as the Board of Public Works may make. This section is not to apply to the completion of the work as specified, but only to extra work, and no tools and machinery to be paid for unless ordered by the Board for extra work.

The contractor shall furnish men and stakes sufficient to enable the engineer in charge of the work to give the necessary lines and levels to construct the work by.

The contractor must deliver to the Board of Public Works on or before the 1st day of each month, a written statement of the amount of extra work done, and extra materials furnished during the previous month.

The contractor will be required to keep the work in perfect repair for twelve months after the same shall have been faithfully completed to the satisfaction of the Board of Public Works.

Monthly estimates will be made by the Board of Public Works of the value of work actually done and in its permanent place; and on or about the sixth day of each month, seventy-five per cent. of the estimated value of the work done the previous month will be paid the contractor; the remaining twenty-five per cent. being reserved as security for the faithful completion of the whole work.

#### STATEMENT OF QUANTITIES OF MATERIAL IN THE OUTERMOST CRIB.

38,814 cubic feet of white pine timber.

3,500 " " " oak "

20,251 ft. bd. mr. of white pine 2 inch plank.

1,700 wrought iron  $1\frac{5}{16}$  in. square bolts 30 inches long.  
 120 " " 1 " " " " "  
 200 " "  $1\frac{1}{2}$  " round "  $13\frac{1}{2}$  feet "  
 50 " " " " " " 18 inches "  
 200 square feet of 1 in. angle iron.  
 6,025 cubic yards of stone filling,  
 Besides 6 inch spikes, and paddle and other gates.

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### AGREEMENT TO CONSTRUCT TUNNEL.

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This agreement, made and concluded this twentieth day of October, A. D. 1863, between James J. Dull and James Gowen, both of the city of Harrisburg and State of Pennsylvania, party of the first part, and the City of Chicago of the second part:

Witnesseth, That the said party of the first part, for and in consideration of the payments to be to them made by the said city of Chicago, as hereinafter set forth, hereby covenant and agree to construct, complete, and put in readiness for use, and keep in perfect repair for one year after the same shall have been faithfully completed to the satisfaction of the Board of Public Works of said city, a tunnel from the lot now occupied by the pumping works of the Chicago Water Works, and extending two miles out under Lake Michigan, with the appurtenances to the same, and to take the risk of all disturbing causes and obstacles which may occur in the construction of said tunnel and appurtenances, and in keeping the same in perfect repair for one year, whether under or above ground, from irruption of waters, springs, quicksands, rocks, waves, winds or storms, or of any other nature or kind; the said contractors hereby agreeing to furnish all the materials of every kind required in the construction and completion of the work covered by this contract, the compensation for the said materials being included in the sum herein specified as the contract price; and they also agree to furnish, at their own proper cost and charges, all machinery, fixtures, structures, and tools of every kind needed or used in the same, and without charge to the city, except



for such machinery, fixtures, structures and tools as may be specially ordered by the Board of Public Works for the doing of any extra work herein referred to. Said work to be done in accordance with plans and specifications prepared for the doing of the same, which plans are on file in the office of the Board of Public Works of said city; and the specifications are appended hereto, and made part of this contract; said work to be finished and fully completed on or before the first day of November, A. D. 1865.

All the work shall be executed in the best and most workmanlike manner, and no improper material shall be used, but all materials of every kind shall fully answer the specifications, or, if not particularly specified, shall be suitable for the place where used.

Should the Board of Public Works deem it proper or necessary, in the execution of the work, to make any alterations which shall increase or diminish the expense, such alterations shall not vitiate or annul the contract or agreement hereby entered into, but the said Board shall determine the value of the work so added or omitted, such value to be added to or deducted from the contract price, as the case may be.

The whole of the work shall be commenced and carried on when and where the Board of Public Works shall direct. Should the weather be unusually wet, or so cold and frosty that any part of the work cannot be done in a proper manner, or with due regard to durability, then the Board of Public Works may order such part of the work to be suspended altogether until a more suitable season, in which case the party of the first part will cover and otherwise sufficiently protect the several parts of the works, so that they will not be injured by the weather.

This agreement shall not be assigned nor any part of the work subcontracted, without the written consent of said Board endorsed hereon.

It is hereby provided and agreed, that if in any event the said party of the first part shall be unable to proceed with the work in accordance with the requirements and conditions of this agreement, that the said city, by its Board of Public Works, shall have full right and authority to take the work out of the hands of the said party of the first part, and to employ other workmen to complete the unfinished work, and to deduct the expense thereof from any money that may be due and owing to said party of the first part on account of the work.

And the said party of the first part covenant and agree to perform all of said work under the immediate direction and superintendence of the Board of Public Works of the city of Chicago, and to their entire satis-

faction, approval and acceptance. All material used and all labor performed shall be subject to the inspection and the approval or rejection of said Board; and the said city of Chicago hereby reserves to its Board of Public Works the right finally to decide all questions arising as to the proper performance of said work; and in particular the right to decide whether any one or more of the four cribs herein provided for, with their cast iron cylinder shafts and appurtenances, may be omitted by said contractors; and in case of improper construction, to suspend said work at any time, and re-let the same; or to order the entire reconstruction of said work if improperly done; or re-let the same to some more capable and faithful contractor or contractors, and to adjust the difference of damages or price, (if any there be,) which the contractor or contractors failing to properly construct such work, in such case of default, should, in their opinion, pay to the city, according to the just and reasonable interpretation of this contract. And it is understood and agreed that no claim whatever will be made by the said party of the first part for extra work or material, or for a greater amount of money than is herein stipulated to be paid, unless some changes in or additions to said work, requiring additional outlay by said party of the first part, shall first have been ordered, in writing, by the said Board of Public Works.

The said city of Chicago hereby covenants and agrees, in consideration of the covenants and agreements in this contract specified, to be kept and performed by the said party of the first part, to pay to said party of the first part, when this contract shall be wholly carried out and completed, the sum of three hundred and fifteen thousand one hundred and thirty-nine dollars, (\$315,139,) and for each foot of height that any one of the cribs for the protection of the lake shafts shall be built above the height stated in said plans and specifications, the sum of eight hundred and fifty dollars, (\$850,) and for each pound of addition made to the cast iron cylinders for the like shafts above that stated in the plans and specifications, the sum of twelve (12) cents. It is also agreed that during the progress of the work, monthly estimates will be made by the Board of Public Works of the value of the work done and in its permanent place, and that seventy-five (75) per cent. of the amount of such estimates will be paid to the said contractors as they shall be issued, and that the remaining twenty-five (25) per cent. shall be reserved as security for the faithful completion of the whole work, and shall be paid when this contract is completed, and the work accepted by the said Board. It is further mutually agreed by the parties hereto,



that nothing hereinbefore contained shall be so construed as to hold the said parties of the first part responsible for any accident or injury that may happen to either of the cribs or lake shafts mentioned in said specifications, after the same shall have been duly fixed and secured in their place, in consequence of any defect or insufficiency inherent in the original plan or design for the same, and not attributable in any degree to any defect or imperfection in the execution of said work by the said parties of the first part.

In testimony whereof, the said party of the first part have hereto set their hands and seals, and the said city of Chicago has caused the signatures of the Commissioners of its Board of Public Works to be hereto affixed, the day and year first above written.

[Signed]

J. J. DULL, [SEAL.]  
JAMES GOWEN, [SEAL.]

J. G. GINDELE, }  
FRED. LETZ, } Commissioners of the  
O. J. ROSE, } Board of Public Works.  
F. C. SHERMAN, }

## ACT OF CONGRESS SANCTIONING THE PROPOSED ERECTION OF PIERS IN LAKE MICHIGAN.

AN ACT DECLARING THE ASSENT OF CONGRESS TO AN ACT OF THE  
LEGISLATURE OF THE STATE OF ILLINOIS, THEREIN NAMED.

*Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled,* That the consent of Congress is hereby given to the operation of the eleventh section, chapter fifteen, of the act of the General Assembly of the State of Illinois, approved February thirteenth, eighteen hundred and sixty-three, entitled "An act to reduce the charter of the city of Chicago, and the several acts amendatory thereof, into one act, and to revise the same," which section is as follows:

"Said city shall have the power to extend aqueducts or inlet pipes into Lake Michigan, so far as may be deemed necessary to insure a supply of pure water, and to erect a pier or piers in the navigable waters of said lake, for the making, preserving and working of said pipes or aqueducts: *Provided*, that such piers shall be furnished with a beacon light, which shall be lighted at all such seasons and hours as the light on the pier at the entrance of Chicago river.

APPROVED, January 16th, 1864."





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